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## ESSENTIALS FOR A SUCCESSFUL TEACHER.

AT the recent commencement exercises of the New Jersey State Normal School, at Trenton, the Reverend W. H. Campbell, D. D., President of Rutgers College, addressed the graduating class in terms appropriate for teachers in every latitude.

He said, in his introductory remarks, that the relations which we sustain to others, and which they, in turn, sustain to us, together with the varied duties which spring from these relations, must all be known before our corresponding duties can be done. Now nearly all this knowledge is traditional—that is, it is gained, if gained at all, by being handed down from one to another. What one has gained by experience, or another by original investigation, all goes to swell the general sum of knowledge; and this, with its constant augmentations, is to be handed down by one generation unto the next, in order that each succeeding generation may act its part better than its predecessor, and do more perfectly the duty which God has assigned to it. Unto every generation it is said, in trumpet tones, "Freely ye have received, freely give." Popular education, in its very idea, recognizes the obligation as resting on a generation to communicate all the knowledge it has and can get, in order to fit the future race of men for acting well their part in life. Paley says: "Education, in the most extensive sense of the word, may comprehend every preparation that is made in our youth for the sequel of our lives;" and the public is bound to make all preparation that the se-

quel of the lives of our youth shall be such as it ought. One must not be allowed to come into life and go without, or get unaided and as best he can, the knowledge which he needs. All experience shows that this would be to send the race back again to barbarism. The firm conviction of all enlightened men and governments is, that public provision must be made to communicate all necessary knowledge, and in the easiest and best way. Hence, the class of persons called teachers has arisen. And a more important and honorable class of men and women does not exist on earth, since their work is—and they are doing it nobly—to prepare man to know and act well his part in life.

He then proceeded to discuss, in his well-known forcible style, some of those elements of character which have, in the past, given success to the labors of the teacher, and in the possession of which the teacher of to-day may go forth hopefully unto his work.

### A THIRST FOR KNOWLEDGE.

Appreciating the end of his own being, the teacher himself wishes to *know*, that he *may do*. It is not merely knowledge for itself, for the mere sake of knowing, which is desired. This would be mere curiosity, which is by no means an elevated feeling. If one knew all the languages into which Babel has cleft the earth, and were that the end of his acquisition, a day laborer, with a very moderate share of knowledge of his mother tongue, but who

took the well-being of others into his thoughts and feelings, his plans and ends, would be not only a better man in the moral aspects of the question, but also a better educated man, in the true sense of the word education. Nor is the knowledge sought because, by the acquisition, its possessor can become rich and powerful. This is mere selfishness, which is a base and sordid feeling; and wherever it gets the mastery it renders a man so consciously base that, self-condemned, he excludes himself, as unworthy, from the society and converse of men of eminent virtue and philanthropy. But the thirst for knowledge, which the good can approve, is his who, while he does not ignore self, or seek to be better than our Lord required, since he commands us to love our neighbor *as ourselves*, nevertheless wishes to know *much* in order that he may do *more*, which will be beneficial unto others.

In a word, then, the successful teacher must first have become a successful scholar. He must, in some way or other, have learned the lesson, and learned it thoroughly, that a man is not his own, having no relations or affinities to others. He is placed here to be rain and sunshine, fresh air and fragrance, food and flowers, any thing and every thing that is good and beautiful, consolatory and strengthening, reforming and purifying, unto every one that needs his help and unto whom he is able to render it. Let this big thought come down into the soul (and what contractibility of heart must first have been overcome before this thought could find room in these shriveled, shrunken souls of ours)—let this big thought, I say, come down into the soul, and it converts the man at once into a most diligent learner. What must I do, and how can my duty be best done? are now the life-questions which are ever asked, and unto which ready answers are also ever vouchsafed; for here he who asks receives, and he who seeks finds. And now, on the strength of the answers, you find him diligently prosecuting his work of preparation for future usefulness. Grammar, Geography, Mathematics, Natural Sciences, Mental or Moral Philosophy, Latin or Greek, French or German, whatever it be whereby his use-

fulness can be promoted, is unweariedly pursued. Early and late you find him employed, and no figure of speech brings up so forcibly before us the desire which ever prompts his action, as that just used by us, when we spoke of a *thirst* for knowledge.

Now put the young man who has gone through such experiences into a school-room, and would you not expect him to succeed? Can you be near a fire and not get warm? Shall the sun shine, and darkness not flee away? Shall a young woman pass before you day by day in the school-room, who has consecrated herself for the good of the children to a life of weariness, bearing their perverseness and waywardness, and manifesting an unceasing regard for the welfare of her pupils, without becoming more fragrant to their moral senses than perfumes and spices are to our natural organs? Before such a teacher an unwillingness to study this subject or that would pass away as soon as the precept of the teacher, fortified by her own beautiful example, had taken hold of the tender heart of the pupil, and convinced him wholly that any study was to be loved and pursued according as it was fitted to make him better and more useful.

It is back of the school-room where the success may be gained, that the foundation of that success was laid. In the private chamber, where seen only by God, he devoted himself to a life of usefulness; in the distant rural school-house, where under many and almost insurmountable difficulties, he prosecuted his studies; in the rooms of this noble institution, where his industry and regard for every thing that is seemly and good, has made his name almost a proverb,—in these spots his success was gained. Here he has sown, and what remained for him was to go forth and reap his harvest.

#### A LOVE FOR COMMUNICATING KNOWLEDGE.

This, in the most of successful teachers, is, in a greater or less degree, a natural gift. They are born teachers. They never knew when they did not love to teach. But this gift is also susceptible of high cultivation; and under those moral experiences, of which I have already spoken as

giving life, energy, and persistence to the thirst for knowledge, this love for communicating information becomes so intense that the mid day meal will often be neglected for the pleasure of imparting knowledge. This it is that takes from the school-room now all that gloom and horror which, under the rule of some pedagogical tyrants, makes it appear as if it were draped in mourning. Under the smiles and sunshine of him who loves to teach, the school-room becomes to the pupil a place of pleasant and useful pursuits, and of joyful mastering of difficulties; the birth-place of bright hopes and aspirations, and the spot to which memory, in after years, will look back with a pure and serene joy. So well satisfied I am that the success of the teacher, in the highest sense of his work, depends on his own thirst for knowledge and his love for communicating, that if I were examining a teacher with a view to his employment, I should question him first and most fully on these two points; and if he was right here, I should feel that there was little reason to fear any deficiency in respect to mere book-learning. But if I should find that a hireling, an impostor, had come to be examined, a man or—oh, tell it not in Gath!—a woman, who neither loved children nor loved to teach them, I should expect to find him deficient also in the mere learning of books; and I should most assuredly try to find out his deficiencies, if he had any, and with heart-felt joy would see him turn his back—and with hearty good-will would help to turn his back—on the school-house of my or any other district. For if there is any one thing short of the immediate frown of Deity, which more than another a parent may deprecate, it is the subjection of his children to the tyrannous, soul-shriveling rule of a man or a woman, who, for six hours of the day, and for six days of the week, has in his care—care indeed! Oh,

sad misnomer!—the susceptible minds of children, to train them to the love and pursuit of those things which he himself hates.

#### APTNESS TO TEACH

Is the last element of the character of the successful teacher which I shall name.

It has been said "that what we know thoroughly we can usually express clearly, since ideas will supply words." If this statement is correct—and I believe it is—then our teacher, with his thirst for knowledge and his love of communicating it, will almost of necessity fall into an easy, simple, clear method of communicating his thoughts, which will make teaching as natural and easy as the putting on of an old glove. There will also be such a hearty sympathy between him and his pupils that, almost by intuition, he will see what is needed to make the lesson of to-day clearer and more impressive; and what was seen to be deficient to-day, the zeal and intelligence of the teacher will supply to-morrow. I never, indeed, knew a really hearty teacher who did not thus become apt to teach. I have known those who, at first, were slow of speech, and through diffidence hesitated much; at times, too, thoughts were given forth confusedly, and hence they failed at first to interest the children. But these difficulties soon disappeared before the zeal and industry of the teacher, who loved his work, and was resolved to succeed. He who himself thirsts for knowledge soon learns that right methods of study are essential to progress; that there is also a right and a wrong way of putting things, and that, when the right method is used, instruction glides gently into the understanding, wins the love of the heart, and then calls forth the prompt activities of the will. The whole man in the scholar awaits the bidding of the earnest, intelligent, loving teacher.

THE Harvard College roll of honor contains the names of three major-generals, two brigadier-generals, thirty-seven colonels, seventeen majors, one hundred captains, seventy-six lieutenants, one hundred

and twenty-seven medical officers, sixty-eight chaplains, twenty-one paymasters, six naval officers, eighty-one privates and non-commissioned officers, besides a large number whose latest rank is not yet known.

## PEDAGOGICAL LAW.

## III.

## PUNISHING FOR MISCONDUCT OUT OF SCHOOL.

WHEN the late Hon. John C. Spencer—a gentleman of such eminent legal ability that he had scarcely a peer at the New York bar—was Superintendent of Schools for the State of New York, he is said to have given the following opinion: The authority of the teacher to punish his scholars extends to acts done in the school-room, or play-ground, only; and he has no legal right to punish for improper or disorderly conduct elsewhere. (Randall's Com. School Sys., p. 262.) But the opinion of any one man, whatever may be his position and learning, can not stand against the decisions of the courts. We have preferred, therefore, to go back of this opinion, and look at the law for ourselves. Although we must confess that in the outset we expected to find authorities to support the opinion rather than to controvert it, now, however, after long and laborious research, we believe that our preconceived notions were erroneous; for although the courts have rarely been called upon to consider this subject, it has, nevertheless, been before them, and the law upon it has been fully and clearly explained.

## A MUSIC-MASTER IN TROUBLE.

This was an action for an assault, in which the defendant, as music-master of the Chichester Cathedral, pleaded a justification of the trespass, as committed by him, in correcting the plaintiff, who was a chorister of the cathedral, and had absented himself from his duty. The cause was tried at the Assizes at Sussex, when a verdict was found for the plaintiff for the sum of £5, it being held that the justification was not sustainable. It appeared that the plaintiff had applied to the master for leave to go and sing at a certain club, but permission was refused. Notwithstanding this refusal, the plaintiff went to the club, and on the next day the defendant, as music master of the cathedral, and consequently having jurisdiction over the choristers,

corrected the plaintiff, and committed the assault complained of. At the trial evidence was offered of the practice at other cathedrals, but was rejected. Evidence was also proposed to be brought forward in order to show that the chorister's practicing at the clubs disqualified him for singing in the cathedral. The judge at the trial thought the evidence too general, and rejected it. The defendant now moved, on the ground of misdirection, to set aside the verdict, and have a new trial. Mr. Justice Bayley observed, thereupon, "that the boy was under an obligation to attend in the church at certain periods, in order to receive instruction, but that the master had no occasion for his services at the time when his absence was complained of." And Chief-Justice Abbott said, that "supposing the boy had bathed and caught cold, that would be injurious to his singing, but would not justify the measures adopted by the defendant." A new trial was therefore refused. (*Newman v. Bennett*, 2 Chitt., 195.) This decision, it will be observed, does not go so far as to say that the music-master could under no circumstances punish his pupils for misconduct out of school-hours, but it would seem that the alleged cause of the punishment was the absence of the pupil from duty, and one of the judges merely decides that "at that time the master had no occasion for the services" of the pupil, and consequently the defense failed. And the chief-justice merely added to this, that even if the boy did injure his voice singing at the clubs, he did not thereby commit such an offense as would justify the master in correcting him corporeally. The court, therefore, seem to have been unwilling to declare that the master could under no circumstances punish his pupil for misconduct out of the hours set apart for instruction, but confined themselves rather to this particular instance, and without declaring any general principle, decided that the offense was not sufficient to justify the act of the teacher. It must be borne in mind also that this is

a decision in reference to the authority of a music-teacher only, and that the jurisdiction of other teachers is altogether more extended. Consequently, even if the court had decided that the jurisdiction of music-masters could not in any instance extend to acts done outside of the school, such a decision would in no respect define or limit the authority of other teachers. Music-teachers, we believe, do not, as a general thing, claim or care to be held responsible for the conduct of their pupils, except during the particular hours that have been set apart for their instruction. The music-teacher's duty is merely to develop the musical faculties, and he has no more power given him by law than is necessary for the accomplishment of that end. The duty of other teachers is not so circumscribed. They are employed for vastly greater purposes. They must teach the science of health, with all the learning, but without the pay of the doctor; they must inculcate the principles of morality with all the impressive sincerity, but without the sectarianism of the minister; they must be altogether more patient and discreet than parents, and more even-tempered than God Almighty himself, for He was "wrath" when he punished the wicked, whereas, if a teacher punishes in anger, he is guilty of an assault and battery; they must invent schemes to invert human nature, and make every good thing and thought enticing, and every bad thing and thought abominably disgusting, especially to the "desperately wicked," who have "no good in them;" they must tenderly moderate the zeal of the too ambitious, and inspire the dullest blockhead with a manly thirst for fame and knowledge; the incorrigibly uncouth and vicious they must endow with the tastes, instincts, and manners of the refined and virtuous. And in short, they must turn all from the thousand paths that lead to indolence, ignorance, and folly, and prepare them to find infallibly all the ways of pleasantness and all the paths of peace. These are the high purposes for which teachers are employed, and it would be a shame and a reproach to require so much of them, and at the same time tie their hands by withholding from them the power which is indispensable to

their success. The law is not so unreasonable—for with every well defined duty the law gives an incontestable right to all the power necessary for the performance of that duty.

#### A REMARKABLE CASE.

In the Court of Common Pleas of Lawrence County, Indiana, a teacher was tried, about six years ago, for assault and battery, and found guilty under the following circumstances:

The evidence showed that the alleged assault and battery was inflicted by the defendant in the capacity of a school-master, on the prosecutor, a boy of some fifteen or sixteen years of age, as a pupil attending his school, by way of correction, for a violation of the rules of the school by the prosecutor. It also appeared that the correction was administered by the defendant on the prosecutor after the adjournment of the school in the evening, and while the latter was on his way home, for an act committed during that time, and which was seen by the defendant, who thereupon administered the correction by the infliction of sundry stripes with an ordinary sized rod. There was nothing conducing to show that the correction was other than reasonable and moderate. The court instructed the jury that although the defendant, as a teacher, was by law vested with the delegated authority to exercise control over the prosecutor as his pupil, during school hours, yet after the adjournment of his school, and after the prosecutor had left and was on his way home, his authority over him had terminated, and his act of administering correction under the circumstances was unauthorized by law, and they must find accordingly; but in fixing the defendant's punishment, they should take into view all the circumstances attending the case, and especially the motives of the defendant in committing the act, and if they should find the circumstances to warrant it, they might fix the fine as low as one cent, and without costs. Under these instructions the jury were constrained to find the defendant "guilty," but they fixed the fine at "one cent and without costs," as had been suggested by the court. (*State of Indiana v. Ariel Fliinn*,

in Bedford Independent.) Here, then, we find both court and jury evidently feeling themselves hampered by what they suppose to be the law, but virtually justifying the act of the teacher, which no doubt was right and proper. This case has often been cited as a strong one against the teacher's right to punish for misbehavior on the way to and from school, but we cannot so regard it. We think it an excellent illustration rather of what courts and juries will do to shield the prudent and conscientious teacher from harm. The only indiscreet thing the teacher in this case seems to have done, was to inflict the punishment out of school. We think it would have been more prudent to wait until the next day, and inflict the punishment in the school. It is always better to take time for reflection before an act, the propriety of which is likely to be at all questioned. Besides the teacher's jurisdiction in the school-room would be less likely to be disputed, and if it were, he could find more and better authorities to support him. In fact the authority of the teacher to punish for the offense may in some measure depend upon whether the scholar continues under the jurisdiction of the master. For if the scholar, after leaving the school in the evening committed an offense as in this case, but never again returned to the school, we think that the teacher's right to inflict punishment under such circumstances, would be more than doubtful. Consequently, we would advise the punishment to be deferred in all cases until it can be inflicted in the school-room.

#### THE UNIVERSAL CUSTOM IN NEW-ENGLAND SCHOOLS.

The following opinion will hardly be questioned by any good lawyer, as it is well known in the profession that the court which delivered it is one of the ablest in the Union. It appeared from the evidence in the case that about an hour and a half after the scholar reached home in the evening, he used insulting language to the teacher in the presence and hearing of other members of the school. The teacher punished the offender the next day in school. Able counsel were engaged on

both sides, and as the first decision was not satisfactory, the case was appealed and argued with great ability before the supreme court. The judges all agreed upon the following opinion: There seems to be no reasonable doubt that the supervision and control of the master over the scholar extends from the time he leaves home to go to school till he returns home from school. Most parents would expect and desire that teachers should take care that their children in going to and returning from school, should not loiter, or seek evil company, or frequent vicious places of resort. Even after the pupil has reached home, and has been there some time, if he should commit any act of misbehavior which would have a direct and immediate tendency to injure the school and to subvert the master's authority, he may be punished for it in school the next day. The misbehavior must not have merely a remote and indirect tendency to injure the school. All improper conduct or language may perhaps have by influence and example, a remote tendency of that kind. But the tendency of the acts so done out of the teacher's supervision, for which he may punish, must be direct and immediate in their bearing upon the welfare of the school, or the authority of the master and the respect due him. Cases may readily be supposed which lie very near the line, and it will often be difficult to distinguish between the acts which have such an immediate and those which have such a remote tendency. Hence each case must be determined by its peculiar circumstances. Acts done to deface or injure the school-room, to destroy the books of scholars, or the books or apparatus for instruction, or the instruments of punishment of the master; language used to other scholars to stir up disorder and insubordination, or heap odium or disgrace upon the master; writings and pictures placed so as to suggest evil and corrupt language, images, and thoughts to the youth who must frequent the school;—all such or similar acts tend directly to impair the usefulness of the school, the welfare of the scholars, and the authority of the master. By common consent, and by the universal custom in our New-England schools, the master has always been deemed to

have the right to punish such offenses, (even though, as in the present case, they are committed out of school-hours.) Such power is essential to the preservation of order, decency, decorum, and good government in schools. (*Lander v. Seaver*, 32 Vermont R., 120.) We cite the foregoing authority with the utmost confidence, and believe it to be entirely correct. But even though the teacher's right to punish for misbehavior on the way to and from school is fully established in point of law, yet, on account of the opposition which it meets with in some localities, we think that it should be exercised only when it appears to be absolutely necessary for the welfare of the school; nor then, except upon the most mature reflection and with the utmost discretion. A teacher may refuse entirely to exercise this right; and he will probably fare better even in the courts, than if he had adopted the other course, and had laid himself liable by exercising the right unnecessarily or indiscreetly. The intelligent and conscientious teacher, however, who sees the necessity and acts from good motives and with discretion, need not be deterred from doing his duty, even to the extent of exercising all his

rights—this particular one not excepted—and he need not fear the consequences. For as he will have done but his duty, the courts of justice will protect him from harm,—the most able by fully justifying his acts, and the less enlightened by fining him "one cent, and without costs."

#### GOOD DEPORTMENT IN SCHOOL NOT ENOUGH.

It was the intention of the Legislature to make the public schools a system of moral training as well as seminaries of learning; and it is as necessary in the unreserved intercourse of pupils of the same school, as well without as within its precincts, to preserve the pure-minded, ingenuous, and unsuspecting children, of both sexes, from the contaminating influence of those of depraved sentiments and vicious propensities and habits, as from those infected with contagious diseases. Consequently, when a teacher expelled a scholar for her immoral practices while at home evenings, his action was sustained by the committee, and afterwards by the court, although no fault whatever had been found with the girl's conduct in school. (*Sherman v. The Inhabitants of Charlestown*, 8 Cush. R., 164.)

## EARLY THEORIES CONCERNING THE EARTH.

### II.

#### ASTRONOMY.

COPERNICUS died leaving his work unfinished, but the world, as we have seen, was ready for a change. Some years after the death of the philosopher, Galileo Galilei, an Italian, became a convert to the new theory, and supported it with the utmost vigor, while he corrected many of its errors. His opponents were principally leading men of the Church, who by the energy of the hierarchy had been enabled to usurp all important positions in the State, and were therefore at the head of all institutions of learning.

#### DIURNAL REVOLUTION.

The diurnal revolution of the earth upon its axis had been most ably presented by Galileo, and as it was most repugnant to the received opinions, was therefore the especial point to which objection was taken. The more important objections were, as might be imagined, theological, although others of a physical character were brought forward in vast numbers. The former consisted merely of Scriptural texts, which the new theory appeared to contradict. These were Joshua, x. 12, 13, which asserts that

the sun and moon stood still in the heavens; Isaiah, xxxiii. 8, where the sun is said to have gone backward ten degrees on the dial of Ahaz; together with many others of like tenor in the Psalms and other portions of Scripture. Galileo denied the propriety of a literal interpretation of such texts, maintaining that scriptural language was merely phenomenal,—speaking of natural occurrences not as they are, but as they appear, and cited the Fathers, Augustine and Hieronymus, to prove that in the primitive Church the language did not obtain a literal acceptance. He explained the phenomena themselves by the refractive power of the atmosphere.\*

Many of the physical objections were of the most absurd and even puerile character, yet all were carefully refuted by Galileo. It is unnecessary, indeed it would be impossible, for us to name here a tithe of the quibbles. We notice only the most plausible one of all, with the beautiful refutation offered by the great philosopher.

#### THEOLOGICAL OBJECTIONS.

The cavilers urged that if the earth made a diurnal revolution, it would move with such rapidity as to leave behind all objects on its surface. To overcome this apparently insuperable objection, Galileo chose the following method of reasoning.

In the cabin of a ship at rest let us put a jar of water containing fish, and set a number of birds at liberty in the room. Let us then kindle a fire, and at the same time so arrange a vessel on the roof, that water dropping from it may fall regularly into a smaller vessel below. Now while the ship remains at rest, the fish move easily in the jar; the birds fly with equal ease towards the bow or stern; the smoke from the fire curls gracefully as it rises; while the water drops steadily into the lower vessel. Let us now impart motion to the ship. Still the birds and fish will move with equal ease in any direction, and as long as the motion is steady, the smoke will curl in its ascent as regularly as before, while the dropping water will not deviate a hair's-breadth to the right or left. This theoretical reasoning was experiment-

ally demonstrated; and thus Galileo showed that, as the motion of the ship was imparted to all objects on it, so the motion of the earth might be imparted to objects on its surface. This he further illustrated by dropping balls from the top of a tower. These fell in a vertical line (as he supposed) to the foot.

#### GALILEO AND THE CHURCH.

Finding all objections futile, the discomfited churchmen resorted to force. Having seized the philosopher, they carried him before the Inquisition, where, in order to escape torture and perhaps death, he signed a solemn recantation of all things contained in his works contrary to the received system. It was while affixing his name to this document that he uttered the memorable words "*E pur si muove*," indicative of his deeply rooted convictions. This is a sad epoch in the life of Galileo, a betrayal of a moral timidity totally unexpected in one who had previously manifested such wonderful intellectual courage. This is the only blot upon his life; but notwithstanding the many attempts to explain it away, it is enough to stain his reputation forever. At the same time the whole proceeding covers his opponents with shame and lasting blackness.

The works of Galileo and Copernicus were then placed on the index of forbidden works, and so remained until 1828. During that year, Pius VII. assembled the congregation of cardinals, and procured a repeal of the edicts. At the assembly, Cardinal Toriezzi proposed "that they should wipe off this scandal from the Church." So bitterly ashamed have the Jesuits been of the conduct toward Galileo, that some years ago their General at Rome denied that the philosopher was persecuted because of his doctrines, and alleged that it was because of his daring insults to the Pope. This explanation, however, can not be deemed satisfactory, so long as the records of the trial are withheld from the public, in open breach of the promise made some thirty years ago.†

† It is time that several works, purporting to be the records, have been published. They disagree, however, in so many important points, as to render them unreliable. The public are not permitted to examine the original copy.

\* For a full statement of the argument, see introduction to Derham's "Astro-Theology," 1727.

## NEWTONIAN THEORY OF GRAVITATION.

Galileo was unable to detail the principles explaining the force by which external objects are retained upon the surface. True, he had conceived of a force attracting; but it was reserved for Newton to discover the force of gravitation, and announce its laws with their proof, by which nearly every difficulty was removed. This great philosopher also repeated Galileo's experiment with the balls, and proved that an error existed in the latter's conclusions. He reasoned that, as centrifugal force is greater at the top of the tower than at the base, balls dropped from the top should fall to the east of a vertical line. Actual experiment proved the truth of his conclusions, and strengthened the general argument of Galileo. Newton's experiments were confirmed in 1804 by an investigation in Hamburg, who afterward in 1805, by an experiment made in the shaft of a coal-mine, ascertained that the easterly deflection during a fall of two hundred feet was five lines, or five-twelfths of an inch.

## TYCHO BRAHE'S THEORY.

Notwithstanding the convincing proofs offered by the advocates of the new theory, it was not readily accepted. Men desired merely an alteration, not an overthrow of their long-cherished system, to which they now adhered with even greater tenacity. But the reasoning of the Copernicans was conclusive. Many modifications of that theory were therefore proposed. Tycho Brahe, the great astronomer, maintained that the earth stood at rest in the center of the universe, and that the celestial bodies revolved about it, while, however, the planets revolved about the sun, being carried with it around the earth. The semi-Tychonic or Platonic theory denied the annual revolution of the earth about the sun, but admitted the diurnal rotation upon its axis.

The relations of the earth to the other heavenly bodies remained a subject of discussion until nearly the close of the eighteenth century. One hundred and forty years ago the Ptolemaic theory was still so popular that Derham, in the introduction to his "Astro-Theology," labored to prove

the Newtonian theory (as the corrected Copernican theory was then termed), in order to justify himself before such of his readers as still opposed it. But as the century advanced the new theory was generally adopted, and under the name "*Copernican hypothesis*," was taught even in the Roman Catholic universities, with but one exception, that at Salamanca.

No persons of intelligence now defend the Ptolemaic theory, while that of Newton is almost universally accepted. Its simplicity, so great as to render the details of the theory comprehensible even to the most youthful student, makes it a powerful argument in natural theology, and all are now able to gain a full understanding of the heavenly systems, instead of being compelled to wander amid perplexing doubts and almost insuperable difficulties.

## COSMOGONY.—MOSAIC TEACHINGS.

Beyond doubt the most ancient system of cosmogony extant is that briefly given by Moses, in the first chapter of Genesis, which maintains that matter is not eternal, but was created in a chaotic mass by a supreme self-existent Being, who afterwards by a series of operations, there detailed, shaped the universe as it now appears. These changes were performed in six distinct periods, termed days, during which successive processes of modeling took place. The account appears to be circumstantially, though not literally true, evidently given merely for the purpose of introducing the history, and not as a complete or detailed statement. It was not literally accepted by the Christian fathers, and is now received as we have given it. A too strict adherence to its literal signification has been one of the greatest obstacles to the advance of cosmological science.

## EGYPTIAN COSMOGONY.

Next in order of age is that of the Egyptian priests, who, like Moses, held that the earth was created by a self-dependent being. Originally it was in the shape of an egg, which was hatched by a peculiar principle, uniting in itself the characteristic ties of both sexes. This theory maintained that races gradually degenerated,

until a certain point was reached, when the globe was renovated. All the important features of this system seem to have been borrowed from that just mentioned. The fiction of the "mundane egg," as it is termed, was undoubtedly taken from the expression in Genesis, i. 2: "and the Spirit of God moved upon the face of the waters." In the original the word here translated "moved" signifies the brooding of a hen over her young. The future destruction of the earth seems to have been a favorite idea among the ancients, for we find it forming an especial feature of most cosmological systems.

#### MYTHOLOGICAL COSMOGONY.

The system found in the Grecian mythology resembles that of the Egyptian priests. The fable of the "mundane egg"\* was early introduced by Orpheus, who in all probability received it from Egypt. It asserted a succession of cataclysms, by which the earth was entirely renovated, and fitted for the existence of higher races. This idea was perhaps borrowed at a later period from the Hindoos. From time to time independent thinkers arose among the philosophers of Greece, who denied the truth of the mythology. Some of the new theories were as ridiculous as the popular belief, while others were worthy of careful examination. The people, however, were so attached to their religion, as to render its theories impregnable, and to endanger the lives of the bold philosophers. Still it can not be doubted that had the reformers fortified their hypotheses by actual experiments, their views would have been more favorably received.

#### HINDOO THEORY.

The Hindoo theory is deserving of notice. Like those already mentioned, it ascribed the creation of the earth to an eternal, self-existent being, who, as the Brahmins maintain in their sacred book, "The Institutes of Menu," at times reposes: then the whole creation fades away; but again it awakes and revivifies the whole universe, which "then has its full expansion." Of these alternate destructions and

revivifications there has been an immense number, all of which the supreme being performed with the greatest ease for the good of its creatures.

This system is worthy of careful examination, not only because of its great antiquity having been completed nearly one thousand years before our era, but also because of the remarkable accuracy of its statements. Many have maintained that it was the offspring of mere imagination; but, as Sir Charles Lyell ably argues, the assertions concerning the length of day at the poles and on the moon can not be mere conjecture: and as these must have been deduced from observation, it is not at all improbable that the belief in successive cataclysms may have been derived from investigations of the crust of the earth. "The Institutes of Menu" were translated and published by Sir William Jones in 1796. The work will amply repay perusal.

#### VARIOUS THEORIES.

The same theory of successive revolutions was, as we have already said, held by the Greeks. A similar belief prevailed among the Arabians. The Gerbanites, a sect of astronomers, which flourished some centuries before Christ, held that after "every period of 36,425 years there was produced a pair of every species of animals, both male and female, from whom animals might be propagated, and inhabit this lower world. But when the circulation of the heavenly orbs was completed, which is finished in that space of years, other genera and species of animals are propagated, as also of plants and other things, and the first order of things is destroyed; and so it goes on forever and ever."\* In these opinions, necessarily deduced from actual observation, we perceive the foreshadowing of a scientific cosmogony, such as we now possess. The Koran offers few speculations concerning cosmogony. It states that the whole creation was completed in six days; an idea obviously plagiarized from the Jewish Scriptures. According to it, the waters of the deluge issued from an oven; a conjecture said by Sale to have been borrowed from

\* This fiction was well ridiculed by Aristophanes in his comedy of the "Birds."

\* Lyell's Principles of Geology; vol. i., page 30—Amer. ed.

the Persian Magi, who represented them as issuing from the oven of an old woman.

#### ANIMALITY OF THE EARTH.

Among the ancients, Plato and the Stoics maintained that the earth is an animal. This wild conception was adopted by Kepler and others, by whom it was carried to the very extreme of absurdity. According to these theorists, the earth is an immense animal, whose breath issuing through volcanoes, its nostrils, cause winds. The tides are caused by the heaving of its vast lungs. On the Scheldt, at Antwerp, the tide once rested during a whole day, because the earth had a fainting fit; and again in 1550, at London it ebbed and flowed several times during twenty-four hours, because the earth had a cough. Throughout the globe a vital fluid circulates: a process of assimilation also goes on; each kind of mineral has the power of converting masses into its own nature, just as we convert food into flesh and blood: the mountains are its organs of respiration, and the schists those of secretion; the veins are sores, and the metals are the products of disease, which is the cause of the ill odor so common among them.

#### PHILOSOPHIC VIEWS.

It is a relief to turn from such extravagant misconceptions to systems deduced from careful and prolonged investigation. During the eighteenth century a more liberal spirit of study existed, and though theorizing without sufficient knowledge of facts still prevailed, yet the hypothesis advanced approximated much more nearly to the truth than the most of those offered in preceding centuries. The era of true progress may be said to begin with 1680, the year in which Leibnitz published his "Protogea," a work which did more toward laying the foundation of a scientific cosmogony than all of its innumerable predecessors.

In that work Leibnitz advanced the daring hypothesis that the earth was originally a fluid mass, whose gradual cooling produced the primitive rocks, forming thereby a crust, that afterwards by irregular contraction ruptured, causing great cavities. Into these the great ocean, formed

by condensation of vapors about the earth, flowed, and thereby lowered its level. The author investigates the subject of inundations, and shows that by the attrition of solid matter, which is subsequently deposited, the stratified rocks are produced. Whence he concludes there is a double origin of primitive rocks, one by cooling from igneous fusion, and the other by reconcretion from aqueous solution. Thus in this masterly work we have the basis of every scientific classification of geological formations.

The general theory of a volcanic nucleus was accepted and ably defended by Buffon and Fourier, while many others of less note incorporated it with their vagaries. It is still a disputed question among geologists. Dana defends it, while Lyell opposes it,\* to a considerable extent. Late investigations, however, seem to bend strongly in favor of a molten nucleus, and lead us to the belief that, allowing for every possible circumstance, the crust of the earth cannot be more than one hundred miles thick.

To dwell upon the innumerable theories offered by the mystic physicists of the eighteenth century, though it might be amusing, would be unprofitable. Toward the close of that century Hutton, a professor at Edinburgh, judging from the appearance of rocks in his vicinity, maintained that all formations were of igneous origin. At the same time, Werner, in Germany, judging from evidences there, held that all rocks were aqueous. The dispute between the disciples of these theorists filled the whole scientific world with strife. In 1807 the Geological Society was formed in London to investigate facts and discourage mere theorizing. From that time the science of cosmogony dates its origin. Facts have been carefully compiled and collated, and now we possess an exact knowledge. The hypothesis of Leibnitz, as enlarged by Laplace, sufficiently explains the origin of the so-called primitive rocks, granite, marble, etc., while the fossiliferous rocks undoubtedly result from the labor of animals, the decay of vegetable matter, and the action of water upon the primitive rocks.

\* See Dana's "Manual," and Lyell's "Principles."

Thus, as briefly as possible, we have given the leading theories concerning our earth. We have seen the human intellect in its infancy groping amid the mire of ignorance and superstition, catching here and there a gleam of truth, whose wonder-

ful strangeness caused it to sink only deeper into its perplexities. But at length emancipated from its bondage, it grapples with great principles, investigates the hidden things of the universe, and distinctly asserts the laws of natural operations.

### WHY LIGHTNING STROKES ARE PAINLESS.

#### NERVOUS TRANSMISSION.

IT is a mistaken notion that an impression upon the nerves—a blow, for example, or the prick of a pin—is felt at the moment it is inflicted. The nerves are not the repositories of sensation; they are but the conductors of the motion which produces sensation. The seat of sensation is the brain, and to it the intelligence of any injury done to the nerves has to be transmitted, before that injury becomes manifest in consciousness. The transmission, moreover, requires *time*, and the consequence is, that a wound inflicted at a portion of the body distant from the brain is more tardily appreciated than one inflicted adjacent to the brain. By an ingenious experimental arrangement, Helmholtz has determined the velocity of nervous transmission both in warm-blooded and cold-blooded animals. In a frog, he found the velocity to be about eighty feet a second, or less than one-thirteenth of the velocity of sound in air. If this holds good, which it probably does, in the case of a whale, then a creature of this class eighty feet long. If wounded in the tail, would not, as Helmholtz has remarked, be conscious of the injury till a second after the wound had been inflicted. But this is not the only ingredient in the delay that occurs between the impression on the nerves and the consciousness of the impression. There can scarcely be a doubt that to every act of consciousness belongs a determinate molecular arrangement of the brain—that every thought or feeling has its physical correlative in that organ; and nothing can be more certain than that every physical change, whether molecular or mechanical, requires time for its accomplishment. So that, even after the intelligence of an impres-

sion, made upon a distant portion of the body, has reached the brain, a still further time is necessary for the brain itself to put its house in order—for its molecules to take up the position necessary to the completion of consciousness. Helmholtz considers one-tenth of a second necessary for this purpose. Thus, in the case of the whale we have one second consumed in the transmission of intelligence through the sensor nerves from the tail to the head; one-tenth of a second is required by the brain to become conscious of the intelligence it has received; and, if the velocity of transmission through the motor be the same as that through the sensor nerves, a second would be consumed in sending a command to the tail to defend itself. Thus more than two seconds would elapse before an impression made upon its caudal nerves could be responded to by a whale eighty feet long.

Now, it is quite conceivable that an injury might be inflicted which would render the nerves unfit to be the conductors of the motion which results in sensation; and if such a thing occurred, no matter how severe the injury might be, we should not be conscious of it. Or it may be, that long before the time required for the brain itself to complete the arrangement necessary for the act of consciousness, its power of arrangement might be wholly suspended. In such case also, though the injury might be of such a nature as to cause death, this would occur not only without pain, but absolutely without feeling of any kind. Death, in this case, would be simply the sudden negation of life, accomplished without any intervention of consciousness. Doubtless, there are many kinds of death of this character. The passage of a musket

bullet through the brain is a case in point; and the placid aspect of a man thus killed is in perfect accordance with the conclusion which might be drawn *a priori* from the experiments of Helmholtz. Cases of insensibility, moreover, are not uncommon, which do not result in death, and after which the person affected has been able to testify that no pain was felt prior to the loss of consciousness.

The time required for a rifle-bullet to pass through a man's head may be roughly estimated at one-thousandth of a second. Here, therefore, we should have no room for sensation, and death would be painless. But there are other actions which far transcend in rapidity that of the rifle-bullet. A flash of lightning cleaves a cloud, appearing and disappearing in less than one-hundred-thousandth of a second; and the velocity of electricity is such as would carry it over a distance equal to that which separates the earth and moon in a single second. It is well known that a luminous impression once made upon the retina endures for about one-sixth of a second, and that this is the reason why we see a ribbon of light when a glowing coal is caused to pass rapidly through the air. A body illuminated by an instantaneous flash continues to be seen for the sixth of a second after the flash has become extinct; and if the body thus illuminated be in motion, it appears at rest at the place which it occupied when the flash fell upon it. The color-top is familiar to most of us. By this instrument a disk with differently-colored sectors is caused to rotate rapidly; the colors blend together, and if they are chosen in the proportions necessary to form white light, the disk appears white when the motion is sufficiently rapid. Such a top, rotating in a dark room, and illuminated by an electric spark, appears motionless, each distinct color being clearly seen. Professor Dove has found that a flash of lightning produces the same effect. During a thunder storm he put a color-top in exceedingly rapid motion, and found that every flash revealed the top as a motionless object, with colors distinct. If illuminated solely by a flash of lightning, the motion of all bodies on the earth's surface would, as Dove has remarked, appear sus-

pended. A cannon-ball, for example, would have its flight apparently arrested, and seem to hang motionless in space as long as the luminous impression which revealed the ball remained upon the eye.

If, then, a rifle-bullet move with sufficient rapidity to destroy life without the interposition of sensation, much more is a flash of lightning competent to produce this effect. Accordingly, we have well-authenticated cases of people being struck senseless by lightning, who, on recovery, had no memory of pain. The following circumstantial case is described by Hemmer. On the 30th of June, 1788, a soldier in the neighborhood of Mannheim, being overtaken by rain, placed himself under a tree, beneath which a woman had previously taken shelter. He looked upward to see whether the branches were thick enough to afford the required protection, and just then was struck by lightning, and fell senseless to the earth. The woman at his side experienced the shock in her foot, but was not struck down. Some hours afterward the man revived, but knew nothing about what had occurred, save the fact of his looking up at the branches. This was his last act of consciousness, and he passed from the conscious to the unconscious condition without pain. The visible marks of a lightning stroke are usually insignificant: the hair is sometimes burnt; slight wounds are observed, while, in some instances, a red streak marks the track of the discharge over the skin.

The effects of a shock of artificial lightning on a gentleman of our acquaintance, who is very sensitive to the electric discharge, may be here described. Under ordinary circumstances, the discharge from a small Leyden jar is exceedingly unpleasant to him. Some time ago he happened to stand in the presence of a numerous audience, with a battery of fifteen large Leyden jars charged beside him. Through some awkwardness on his part, he touched a wire which should not be touched, and the discharge of the battery went through his body. Here life was absolutely blotted out for a very sensible interval, without a trace of pain. In a second or two consciousness returned; the recipient of the shock saw himself in the presence of his

audience and apparatus, and, by the help of these external facts, immediately concluded that he had received the battery discharge. His *intellectual* consciousness of his position was restored with exceeding rapidity, but not so his *optical* consciousness. To prevent the audience from being alarmed, he observed that it had often been his desire to receive accidentally such a shock, and that his wish had at length been fulfilled. But while making this remark, the appearance which his body presented to him was that of a number of separate pieces. The arms, for ex-

ample, were detached from the trunk, and seemed suspended in the air. In fact, memory, and the power of reasoning, appeared to be complete long before the optic nerve was restored to healthy action. But what we wish chiefly to dwell upon here is the absolute painlessness of the shock; and there cannot be a doubt that in the case of a person struck dead by lightning, the passage from life to death occurs without consciousness being in the least degree implicated. It is an abrupt stoppage of sensation, unaccompanied by a pang.

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### THE FRENCH SYSTEM OF TEACHING DRAWING.

NO system of education can be considered complete which does not aim to instruct and develop the senses of hearing and of sight. Attention to the cultivation of the latent powers of childhood, in the sister arts of music and of drawing, is therefore equally necessary in all properly constituted educational establishments. The first instructions on sound and observation are given by Nature herself, and in her ever open book the primary lessons are always first studied and practised. If music is needed to draw forth and exhibit the delicate powers of the ear, drawing is equally necessary to elucidate, correct, and strengthen those of the eye. If the former is the most ethereal, the latter is certainly the most useful. It is difficult to say which is the most ennobling, both appearing in, and justly taking their proper places at the head of the advanced guard of the civilization of mankind.

It is true that music has already had her claims acknowledged, and is now admitted to be an indispensable requisite both for harmonizing, regulating, and disciplining the children of our public schools. It is not the first of her triumphs. The mind naturally reverts to the period of the first discovery of this continent, when Pizarro found the most arduous labors cheerfully performed, at her behest, by the people of Peru. Penetrating still deeper into the

mists of time, we hear again the cheerful songs of the harvest men, and the various handicraftsmen of the classic land of Greece—their mournful Linos—or joyous Hymeneas—or see her warriors again marching to the plain of Marathon

“In perfect phalanx, to the Dorian mood  
Of flutes and soft recorders,”

to triumph over the countless host of the barbarians.

But the sister art of drawing, the mother of architecture, painting, and sculpture, the grace and beauty, the dignifier and exalter of all civilized life, which was in the same land equally honored, and whose more material footprints there are better preserved and attested in thousands of “marble memories,” still waits, at the threshold of many of our institutions of learning,—an almost unwelcome guest. The reason for this, it is submitted, is, that music can be taught in classes, whilst drawing requires also careful individual instruction. This demands a greater outlay than the nation or State is willing to grant, and therefore it prefers to submit to receive the main portion of its designs from Paris or London, rather than to originate them in America.

In order to remedy this as far as linear drawing is concerned, a well-known publishing house proposes to issue a series of

books, each containing twenty carefully drawn and graded copies, from a straight line upward, ruled on the principle which has long been in use in the Government Schools of Design in France, which will lead pupils, by easy gradations, to a knowledge of and some proficiency in the art of design. The first numbers issued will be of the size of a common writing-book. Very few rules will be given, and it will be necessary that those given shall be strictly attended to. It is hoped that in these, teachers who are not themselves proficient in the art, will yet be able to correctly instruct youth therein, from the simplicity with which they will be illustrated, and the ease of the gradations by which success is believed to be attainable. Correctness in pencil or crayon drawing consists merely in being able to make a true straight line, or a true curved line; when this is acquired, and the eye is instructed to comprehend and the hand to execute this operation without failure, proficiency in linear imitative drawing is attained.

As a matter of philanthropy, this art should be introduced into all our primary schools. To all children under ten years of age rapid variation in study is both requisite and beneficial. The eye, the ear, the hand, and the mind of such demand and revel in constant instruction. To them change is relaxation. When it is considered in how many branches of edu-

cation drawing is almost a requisite, and how useful and necessary it is in the fields of labor, art, and science, it must be admitted that any one who succeeds in preparing or pointing out an easier road to proficiency in the use of the crayon or pencil, will have effected a very great desideratum.

The primary department of our public schools is thus particularized for the reason that it is believed that drawing, like elocution, is a plant indigenous in civilized society, and that very great results might be expected from its early and continued cultivation. Grace is, to most children, a natural gift: unused and often unmatured in our schools, it droops, withers, and decays. The desire to imitate the form and color of any striking object, is almost universal among little children. After a lapse of years, during which these gifts have been neglected, is it to be wondered at if noxious weeds only are to be found in the places once occupied by these tender plants, which, had they but been early and properly cultivated, might have rewarded the world with their fruits? These thoughts are not submitted as original ideas, for they may be found largely developed in many modern works, and are now exemplified in some modern systems of education. They are merely suggested as elucidations of the necessity of early attention to the training of children correctly in the arts of imitative drawing, coloring, and designing.

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## THE STORY OF PETER PEDAGOGUS.

A SWISS SCHOOLMASTER OF THE OLDEN TIME.

### CHAPTER II.

#### HIS FIRST TEACHER.

**M**Y first teacher was old and ugly. He was fond of snuff, and took frequently of gin. His income was very small. To eke out this he carried on the cooper's business—the school, in winter, being his workshop.

He was considered clever, for he could measure hay, and even write letters and

testimonials for the peasants. In his teaching there was not much method. His pupils, in the morning, learned the lessons which they had to repeat to him. He took little trouble with the lessons, for he had one or two adjutants to do the most of the work.

Of order there was none—the deficiency being made up by much whipping. There was no respect for him. The boy who could annoy him most was the hero of the

school. Many tricks were played upon him: his wide coat pockets were filled with pebbles; his snuff-box emptied and filled with sand, and nails were driven in the planks which he had to saw. When he fell asleep, which was often, the usual hubbub gave way to silence. The depth of his slumbers was tested by dropping a slate. If this did not arouse him, then a council of war was held; and they proceeded to tie him fast to his chair, blacken his face with ink, or put pitch in his hair. This done, all retired from the scene. The next day the master, without making any attempt to find out the ringleaders, used the rod with marked emphasis. And a certain few of the more enterprising boys received a liberal share of the blows.

For my own part, I rather sympathized with the master, and took no part in these tricks. I learned my lessons, and gave him as little trouble as possible. He seemed to appreciate me, and boasted that I had "brains enough to be a schoolmaster." He taught me many things which were not taught to the other boys; and when I could read "with the book upside down" he made me his assistant.

Finally, when I had resolved to abandon the innumerable hardships of my father's house, this kind old man aided me in finding a situation as teacher.

#### HIS FIRST EXAMINATION.

My first attempt was to secure a school in a neighboring village. It was none of the best; but I was anxious to make a beginning. The day for the examination of candidates was fixed. My old schoolmaster concluded to accompany me, to see that justice was done, but more especially to prove his importance in spite of the young "new-fangled teachers," who treated him with disdain.

As for me, I had not entered the doors of any new-fashioned school, such as had been introduced since the French came amongst us, and in which nothing was learned but haughtiness and worldly things. He would, nevertheless, bet a trifle that I excel them all. This I owed all to him alone, and not to an Immoral School, or whatever else the concerns were called. Still, he continued, if I should chance to

be asked any thing which I could not answer, I had only to look at him, and he would give me a wink or whisper it into my ear. I need not be afraid so long as he was at my elbow. The minister was his particular friend, for he had once stood beside the reverend gentleman when he was buying tobacco at the apothecary's. The school commissary he also knew well. He had one day changed horses at the Cross of Laugenthal, when he (the old man) was standing at the inn door, and had kindly wished him a good evening. True, it was morning at the time; but such great men are not supposed to know what o'clock it is. Any thing he told these gentlemen they would take for granted, quite as much as if they had seen it in print; they knew their men, and knew whom they could trust. The examination was only a stupid formality, the recommendation was the grand thing, coupled with the good opinion of the authorities themselves.

Going along, my mentor gave me instruction in deportment, showing me how I was to salute the examiners. Unfortunately, in illustrating a bow, his iron-heeled boot, which he struck out vigorously, came in contact with my shin bones, and almost disabled me.

He repeated to me the terms by which I was to address the gentlemen. I recollect now, as well as if it were yesterday, the difficulty I had in pronouncing the words Reverend Mr. Schoolcommissary, and how the old man laughed when I said Reverend Mr. Schoolmilitary. The term commissary had till then been perfectly unknown to me, and the peasant tongue reluctantly articulates foreign terms, probably from instinct, knowing that things from abroad are not always wholesome.

Whilst I was thus being initiated into the mysteries of etiquette, we arrived at the village. Being rather late, the gentlemen were no longer at the parsonage. They had gone to the school-house, and were already engaged with the candidates, of whom there were seven. I began to feel a little heavy at heart: not so my companion, who, marching boldly into the midst of the party, supported by his long stick, saluted the examiners with bows

and titles, shaking them all by the hand, as if they had been old acquaintances; then, beckoning me forward, introduced me with a consequential patronizing air, as a youth that would please them, and who was almost as clever as himself.

In accordance with my morning's instructions I made a bow and a scrape, but fairly broke down at the titles. I could not for the life of me recollect whether I should say Rev. Mr. Schoolmilitary or Rev. Mr. Schoolcommissary.

After the names of the seven candidates had been written in the usual way, the examination commenced. The reading I got over beautifully and effectively, giving the vowels and final syllables a fine full sound, as if an *o* had been standing before each of them. The examiners seemed highly pleased with this performance, for a smile rested on their countenances. The answers to questions out of the Catechism also went off very fairly, and things wore a promising look; but, unfortunately, the man had told me to maneuver so as to get the topmost seat; for, said he, the first candidate always gets the appointment. I had managed accordingly to get the top seat, but had to pay somewhat dearly for the mistake, my position making me the first person questioned.

After the catechising, the children's Selections from the Bible was taken up, and I was asked to explain the fortieth history of the Old Testament. I began by asking the question: Who was Adam and Eve? for my schoolmaster had told me that it was always wise to begin with three leading personages, as they afforded greater scope and a wider range. The school-commissary, however, stopped me at once, which appeared to me very unbecoming, since surely at an examination the candidate is justified in showing himself off to the best advantage. He said I must stick to the subject, for if I always began with Adam and Eve (I had only done so once before), they would have to pray for a Joshua to arrest the progress of the sun. All laughed at this sacrilegious remark; and I, being thoroughly perplexed, had nothing more to say.

"Now," said the commissary, "let us hear you construe. That, after all, is the

main point: when any one has properly construed a sentence, he is pretty sure to have some conception of its meaning."

I stared at the speaker with open mouth. I had not the slightest idea what construing was, the word not having yet been introduced into my vocabulary. "Go on," continued the commissary impatiently; "look into your book, and construe the first sentence you come to, there is nothing printed on my nose for you to look at."

It occurred to me that construing might be a French word signifying "to spell," and that the gentlemen merely wished to air their learning a bit; so I began to spell out lustily the words in the book before me.

"Do you understand your own language?" inquired the commissary.

"Yes I do, Rev. Mr. Schoolcaptain," replied I.

"Well then, construe," said he.

"I have spelt, sir," said I.

"Do you understand your own language, I ask again?" exclaimed the commissary angrily.

"Yes, Rev. Mr. Schoolmilitary," replied I; "but I do not understand French."

This brought out a peal of laughter from all and sundry; in which even the other candidates joined. I then felt that I had put my foot in it somehow, and that all chances of success had departed.

We were next set to try our skill in composition; and here again I was at fault. Nobody had ever told me that writing was used for any other purpose than making small letters and capitals; it had never occurred to me to write words from memory, and no one had ever hinted to me that such a thing would be requisite. I looked, therefore, at my neighbors, and they looked at me; but all our slates remained empty. One only, pretending to be more skillful than the rest of us, put something down. Luckily, the gentlemen went off to dinner, leaving us to accomplish our task at leisure; thinking, perhaps, that our empty stomachs, acting in inverse ratio to our heads, would prove expert prompters.

After the gentlemen left, the spectators gave us what assistance they could, which did not amount to much; but they joined us in grumbling at being put to such tests,

and that schoolmasters were required to know such things. It was quite unexampled in the recollection of the oldest person present. Each candidate had written a few lines, and the gentlemen, on returning, glanced over them; but we could see that our work did not excite much admiration.

Arithmetic was limited to finding the cubic contents of a haystack; and then we were tested in singing. Each of us had to intone the *ut, re, mi*; and, loudly as we bawled, the commissary, with his hand behind his right ear, stepped close up to us, and, holding his ear close to the singer's mouth, received many a vigorous roar into it. Why he put himself to this inconvenience it is hard to say. He seemed to have no ear for music, yet he affected a critical air, and made eyes as if he had got the spleen. After the singing had gone round,

he asked me, with a pompous mien, whether I could tell him the difference between figural and choral music. To this, of course, being more French, I could not reply in the affirmative. But, by this time, I had got a little more cunning, and, taking advantage of a stratagem often resorted to in school, answered that I knew the difference, but could not express it in words. This answered the purpose extremely; for the commissary afterward put his questions so as to elicit either yes or no. This way I got on amazingly well, though I understood nothing whatever of the subject.

For all that, I did not obtain the appointment. The school was given to one of the other candidates. I had, however, learned not to go up for examination again till I knew the difference between construing and spelling.

#### A FEW PROBLEMS ILLUSTRATED, FOR PUPILS.

THE importance of the new magnetic globe as an educational aid is too great to be passed unnoticed in these pages. Many points concerning the shape and motion of the earth, day and night, gravitation, up and down, centrifugal force, etc., are generally incomprehensible to the child. These can be clearly illustrated by the use of this globe and its accompaniments. We will present a few, in language suited to the pupils of our schools. Many more can be easily made, all of which will prove profitable and amusing.

##### THE SHAPE OF THE EARTH.

In the small box which accompanies PERCE'S MAGNETIC GLOBE, will be found a



number of figures of men, animals, ships and steamers. Place some of these objects on the surface of the Globe, and see how curiously they adhere to it, wherever they are placed. The Magnetic Globe, you observe, is round,

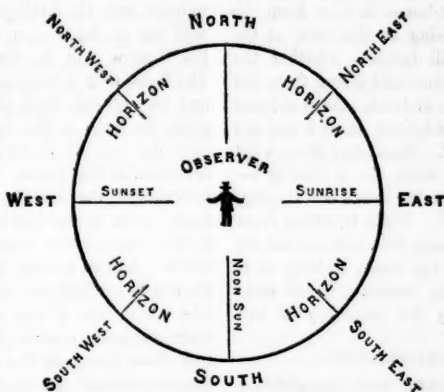
or spherical. The earth on which we live is also spherical, or nearly so. In old times, people thought it was a great level plain, surrounded by water—some thought it was shaped like a large drum—none believed it was spherical, or round; and all thought it stood still, while the sun, moon, and stars revolved around it. But in later years men sailed quite around the earth. A Portuguese, named Ferdinand Magellan, was the first who made this wonderful voyage. He sailed from San Lucar, in Spain, on the 20th of September, 1519, and directed his course toward the west. Here we will say, that the wire which passes through the Globe represents an imaginary line drawn through the earth from North to South, called the axis of the earth, because the earth turns on that line, the same as the Globe turns on the wire. The center of the circle at the top of the Globe is called the North Pole; and the center of the circle at the bottom of the Globe is called the South Pole. If you can imagine the little Globe suspended in the air, revolving freely *without* the wire, as it does *with* the wire, then you can imagine how the Great Globe on which we live revolves in space on its axis. Place a figure of a man on the equator, with his

face toward the North Pole. His right side then is toward the East; his left toward the West. He faces the North, and his back is to the South.

Here is a diagram which will explain this very clearly. Now, having learned about North, South, East and West, we will follow the course of Magellan on his voyage around the world, with the aid of the Globe and Objects. Place a light-house in the south of Spain, near the sea-coast. Magellan sailed for a long time toward the West, and reached a safe harbor on the eastern coast of South America, in Patagonia, which he named Port St. Julian. Next he sailed south, and entered the straits at the south of Patagonia, which bears his name. (Place a Magnetic Object at the eastern entrance of the Straits of Magellan.) Having cleared the Straits he stood out boldly into the great expanse of an unknown Ocean. After a long voyage to the northwest, he reached the Philippine Islands. (Here place an Object.) The weather was so fine that he called this ocean the Pacific. Magellan landed on one of the Philippine Islands, where he was received by the natives in a friendly manner, but they afterward cruelly murdered him, and as many of the Spaniards as were on shore. Those in the ships set sail in all haste, and continued on their voyage toward the south, through the Malay Archipelago to the Moluccas, or Spice Islands. At one of these islands, one of the ships remained to repair. The other sailed to the southwest, through the Indian Ocean, and around the Cape of Good Hope, at the southern extremity of Africa. (Here place another Object.) Then they sailed north along the western coast of Africa (place one more Object on the West Coast of Africa, a little to the north

of the equator), until the 6th of September, 1522, when they arrived in Spain, near Seville, the point from which the ships had sailed three years before. Thus was com-

pleted the first voyage around the globe. The good ship was drawn ashore, and long preserved as a monument of this most remarkable voyage. The fact that the earth is round, at least from east to west, was clearly established. Now we will try



an experiment to prove the rotundity of the earth from north to south. We have seen that navigators have sailed quite around the earth from east to west, but they have never been able to do this from north to south. Having removed all the objects from the globe, we will take another, representing a light-house, and place it at San Francisco, California. Next place a ship on the Pacific Ocean, to the south of San Francisco, at that point on the globe where it will be concealed by the roundness or convexity of the earth's surface, from a person whom we will suppose to be in the light-house. We have to place it away to the south of the equator; but you must know that although we can see but a few miles of the earth itself, yet our globe is a very little world, and we can see what represents a great many miles on it at one view. When you are told that the smallest grain of sand placed on the surface of this globe is higher, when compared with the size of the globe, than is the highest mountain-peak of the Andes when compared with the size of the earth, you can readily see why we have to place the ship so far away, to hide it from the light-house by the convexity of the globe. To return to our experiment. You will see that when the ship is drawn toward the light-house, the top of the mast would first be seen from the light-house; and the

top of the light-house would first be seen from the ship. As the ship approaches, she rises gradually to the view of the observer in the light-house, while in the same manner the light-house is seen from the ship gradually rising to the view of the sailors. This will happen, whether the ship approaches the light-house from the north, south, east, or west. As it appears on our little globe before us, so it appears on the earth itself. No matter from what point a ship sails, when she is coming toward us we first see the masts and rigging, and at last the hull. If she is sailing from us the hull disappears first, and the last we see of her is her top-masts, sinking, as it were, beneath the waves. These facts prove conclusively the rotundity of the earth.

#### SHADOW EXPERIMENTS.

You will find drawn upon the globe, a little to the left of the continents of North and South America, a curious diagram. Its centre is at the equator, and it extends north and south, within the limits of the Torrid Zone. It shows the various points of the earth's surface where the sun is vertical or directly overhead at noon-day, and the days of the month in each year on which the sun is vertical at each point. This diagram is called the Analemma, a Greek word meaning altitude or height. On two days, the 20th of March and 30th of September in every year, the sun is vertical at noon on the equator, and at that hour on those days all perpendicular objects on the equator will appear to cast no shadows. Their shadows, in fact, are hid by their own bodies, for, if they should be lifted up we would see their shadows directly beneath them. Of course, in the morning, their shadows would be cast due west, and in the evening due east. We will try a little experiment with the globe and objects, to illustrate the rotundity of the earth from north to south by means of shadows. Place an object representing the Ethiopian, if you please, on Lake Victoria Nyanza at the equator in Africa. This is the source of the Nile lately discovered by Captain Speke. Now, place another object representing a lion, in Nubia, on a line north and south with the Ethiopian, and place a third object, an ele-

phant, to the south of the equator near Lake Nyassi, in a line with the two other objects. Place the globe either in the light of the sun, or of a lamp, in such a manner that the Ethiopian on the equator will cast no shadow, or, as it were, so that his shadow will be directly under him. The light now is vertical to the African, and its rays fall upon the equator of the globe the same as the rays of the sun fall upon the equator in Africa when the sun is vertical at that point. Observe next the direction of the shadows of the other objects. That of the lion is cast toward the north; that of the elephant toward the south. And so it is on the earth. When the sun is vertical the shadows are invisible, while those living to the north cast their shadows toward the North Pole; and those living to the south cast their shadows toward the South Pole at noon. To prove this would not be the case if the earth were flat, take a piece of sheet-iron, and place the three objects upon it, at the same distance apart as they were on the globe. Now hold them in the light in as nearly as possible the same direction, and their shadows are all cast the same way!

#### UP AND DOWN.

Place an object representing a European on the globe at London, in England, and place another object on the Antipodes Island, a little to the southwest of New Zealand. You see that their feet point downward toward the center of the earth, and toward each other. If they could descend until they reached the center of the globe, their feet would touch; but should they be brought back toward the surface of the globe, they would be going upward, and if they had the power of flight they could go in opposite directions forever. "Down," therefore always ends at the center of the earth, "Up," diverges into the unlimited space of the universe.

#### DAY AND NIGHT.

Place a magnetic object in the center of Africa on the equator; place another object at Quito, in South America; another on the Island of Sumatra; and another, representing a ship, on the equator in the Pacific Ocean north of Navigator Islanda.

Place the globe in the light of a lamp so that the shadow of the man in Africa is invisible. The light now falls on the globe the same as the light of the sun falls upon Africa at noon-day. We will say, therefore, that it is noon with the man in Africa. Now, if it is noon with the man in Africa, what time of day is it in Quito, in Sumatra, and on the ship? If it is noon with the man in Africa, the sun must be over his head, and the inhabitant of Quito must see the sun rising in the east; at

Sumatra the sun is setting in the west, and it must be midnight with the ship. Revolve the globe slowly from west to east. Soon it is noon at Quito; morning on the ship; midnight at Sumatra; and evening in Africa.

In this manner the changes of day and night continue on the earth. The sun is rising and setting continually on some portions of the earth. While some are enjoying the wakeful daylight, others are seeking the repose of night.

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### EDUCATING BY MACHINERY.

THE papers report that at the establishment of Messrs. Chambers, publishers, London, Mr. Alfred Long, in the presence of some fifty ladies and gentlemen, recently exhibited an apparatus and explained its adaptability for teaching languages, music, and other branches of education. The "Patent Metabolical Machine," the title which Mr. Long has given to this piece of mechanism, is an adaptation of the kaleidoscope principle, very similar in appearance to the old lottery-wheel, and is constructed so as to present to the eye an endless succession of musical combinations, or of sentences in grammatical or idiomatical form. These are produced by the inter-

changing of the words on the bars, which have been previously selected and arranged according to a certain formula, and then written upon the faces of little cubes. The machine was originally devised to illustrate the method set forth in Mr. Prendergast's work on the "Mastery of Languages." The beginner commits to memory two foreign sentences very perfectly. The English translations are inserted into the machine, and whenever it revolves a different variation of the words appears at certain openings in the instrument. The system requires that the learner shall go on translating these variations until he shall have obtained the "mastery" over them.

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### MANUAL DEXTERITY.

WHILE the brain of mankind is invigorated and educated by correct study and discipline, the other parts of the body, more particularly the hand, and some organs, as the eye, can also be trained to tasks which, at first thought, seem wonderful and impossible. There is no labor to be done, no skill in artificing or fashioning the metals, that is beyond our reach. Even jugglers, who have no trade, depend upon digital swiftness, or the slight of hand, to perform their "miracles" successfully; and the safety of rope-dancers depends not merely upon their balancing poles, but

upon the degree of education they have imparted to their feet. If in such callings as these, wherein the sole object is to please the multitude, the culture of the members and organs of the body is essential to success, may we not say that in the mechanic arts, upon which such important issues now hang, manual dexterity is now indispensable? This, allied to intelligence, is what makes first-class workmen. It is by no means to be despised, for excellence in this respect is attended by many other qualities which are of the utmost service in the trades.

## AMERICAN EDUCATIONAL MONTHLY.

OCTOBER, 1865.

### "RECONSTRUCTION."—THE EDUCATIONAL BASIS.

NOW that the war for the Union is ended, the question of "reconstruction" is all-absorbing. How shall the States be brought back to their allegiance and to the discharge of their appropriate duties as members of the national family? How shall the good spirit of fraternity be made to take the place of the evil spirit of discord? How shall the asperities engendered by the great conflict be softened, and our people in all sections be led to regard each other with that feeling of mutual confidence and affection so indispensable to the unity, prosperity, and permanence of the republic? These are grave questions, and they are "more easily asked than answered." But they confront the American people at every turn of public affairs, and they challenge the most serious attention of the highest statesmanship. Great have been the burdens and sacrifices of the war. Gigantic have been its labors. Complicated and difficult have been the problems which it has forced upon us for solution, and the nation has at times "hung breathless on its fate," in view of them. And yet the difficulties which a state of peace has thrown upon us are not a whit the less perplexing than are those which we have, through much tribulation, succeeded in mastering. The problems of the war were those which refer to the marshaling and wielding of material resources in such a manner as to establish the authority of the government. The problem of peace is how best to deal with the subtle forces of the human heart, how to calm the rage of excited passions, how to allay the pangs of wounded pride.

We are not of those who believe that to heal the maladies of this nation is the work merely of a day. For generations has the virus been at work. The antagonistic principles have from the beginning coexisted in our national life, and each has struggled to gain the mastery. At last the hour arrived when either one or the other must assert its supremacy. The nation must live or die. It chose to live, and it has vindicated its right to life. But the disease itself being chronic, can be finally eradicated only by a thorough treatment. The leaders of the rebellion and those who have contributed their material aid and moral support, will never again become reconciled. It is not in the nature of the human heart that they should.

There are, however, other classes who can be reached by a far-sighted, comprehensive, and liberal policy. Before they can be made good and loyal citizens they must be made intelligent, and capable of appreciating the blessings of freedom. No reconstruction can be real and substantial which leaves this out of sight.

The process of reconstruction must necessarily be slow. Years, perhaps generations, must pass before it can be complete. Measures should be at once taken to secure sound and wholesome instruction to all who are hereafter to exercise an influence in shaping the destiny of the republic. Each State should provide for the education of all its children. The Constitution of the United States guarantees to every State a republican form of government. Universal education is conceded to be indispensable to the existence of a republic. Let American statesmanship rise to the full measure of its duty by recognizing in its policy of reconstruction this truth, so fundamental in its relations to our future prosperity and happiness as a people. Universal loyalty is the product of universal education. This nation can never be firmly united in the bonds of liberty, equality, and fraternity, until the spirit of these

"better angels" is made universal through the national schools. That statesmanship is very short-sighted indeed which closes its eye to this stubborn fact.

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THE HARRISBURG CONVENTION.—EDUCATIONAL UNIFORMITY.

THE National Teachers' Convention, recently held in Harrisburg, was numerously attended. Some of the leading educators of most of the Northern States were present: the governors of Pennsylvania and Maryland, and other non-professional friends of education, took part in the proceedings, and an earnest, almost enthusiastic, spirit was evinced, which will for a long time exert a beneficial influence. Surely, *some* moral stimulant is needed. While in a few States the welfare of the schools is studied and provided for with a solicitude felt for scarcely any other interest of the commonwealth, in others there may be discovered a listlessness in the general management of the school system, and a crudity in the practical modes of instruction, which must be regarded as but little worse than utter neglect. Many States are without school journals and normal schools; in some, proper school officers are unprovided for, and in not a few there is found only a nominal system of instruction. In various directions, reforms should be instituted without delay.

And while about it, while the recent proceedings are still under discussion, let the prominent feature of the recent convention be steadily held in view. We should have greater uniformity of instruction,—a national system of education. We know that in the effort to effect this desideratum, our truly great men, our thinkers, workers, and leading educationists, begin a heavy enterprise; but it is a noble one. Like all great enterprises, faithfully prosecuted, it will pay a handsome dividend; the result will be a liberal

compensation. Swamps, forests, rivers, mountains, are no impediments in the line of a continental railroad. The telegraphic cable must be carried across the ocean; or if fleets fail in the enterprise or are lost in the undertaking, the North Pole itself will be conscripted into the service and virtually constitute one of the telegraphic poles of a grand overland line of communication, *via* snow-hills and icebergs. And our national intelligence, our American thought, which it is manifest only the lightning can transmit with sufficient rapidity, must have some correspondingly liberal treatment, some scientific continuity of manipulation. It must not be dwarfed and weakened by senseless unscientific pedagogism. Now is the time to act. This is the propitious era of reform. Education is not a stationary engine; it is a locomotive which draws only while it moves. Systems of instruction must be essentially progressive, or they will ultimately be mere clogs and barriers. While the world moves, let not the schoolmaster stand still.

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A POETICAL ANATHEMA.

WE have heard vituperation in various forms, we have heard maledictions manifold, from suppressed mutters to curses "loud and deep." We have read the fulminations of the Romish vicegerent of the Almighty, in the magniloquent and bitter imprecation of *Anathema Maranatha*. But never have we heard or read any thing transcending the studied malevolence embodied in a single lyric—in two smooth lines of a rhyming stanza—induced by our recent political complications. The spirit of malevolence is incarnate. There has been too much of imprecation on the part alike of the North and the South, and we present the passage referred to, not with the view of inciting any incipient hero to blasphemous patriotism, but as a literary curiosity, showing condensation of

thought and feeling, and exhibiting the capability of our Saxon tongue. We give the stanza entire.

For this our curse do we bequeath  
To Albion, hated foe!  
The sword she caused us to unsheath,  
Already meditates *her* death,  
And vows *her* heart a blow;  
We curse her with our *deepest* breath,

Curse her for war and woe—  
Curse her at every loyal hearth—  
*Curse every rod of her green earth—  
With every blight we know.*

After reading this who can say that David's "cursing psalm" has not an equal, —who can deny that the holy psalmist has found his peer in the modern patriot-poet!

## EDITORIAL CORRESPONDENCE.

### THE GERMAN THEORY OF EDUCATION.

HEIDELBERG, Sept. 2, 1865.

IN my last letter I gave some account of German schools, in connection with the great and world-renowned Orphan Asylum of Halle, an institution which has so far outrun its original purpose that now the day-schools which it affords to the children of that city are among the most celebrated in Germany. I am tempted to devote the first of this letter, at any rate, to some remarks on the educational theory prevalent in this land, and to some general observations which may grow out of them.

The fundamental idea which obtains in Germany is that each branch of employment requires, on the part of those who carry it on, a certain amount of intellectual development, or education, which if fallen below or risen above, becomes detrimental. The blacksmith needs to be educated up to this point, the lawyer to that, the schoolmaster to yet another. To be over-educated is considered as serious a calamity as to be under-educated: and to know too much is thought to lead to a discontent, an unsatisfied ambition, and a roving mind, which are at entire variance with the tranquillity in which men ought to live. Superadded to this is yet another notion more false and fatal still, namely, that what the father is, that the son, without there be some paramount reason to the contrary, ought to be. The peasant's son must be a peasant; the shoemaker's son must be a shoemaker; the musician's son must be a musician. Now as the mother in more cases than the reverse gives her intellectual aptitude to the child, it follows that the nation which adopts this custom can never excel; its people do not rise to their natural level; often a fine cabinet-maker is spoiled to make an indifferent minister. This is a secret which we understand in America; we lay the whole great variety of trades, employments, professions, open to every young man, and we bid him study himself carefully, and then make his choice. No doubt mistakes are often made; men find

out their real aptitude too late, and both they and the State are losers. But there can be no proportion between the loss experienced from this in such a country as the United States and such a country as Germany. Here every village may have its "mute inglorious Milton," who spends his life in silence, and passes to an unhonored grave; but with us, if there be a natural poet, a true child of song, from the corner of the country newspaper he quickly finds his way to the "Atlantic," and honors without stint pour in upon him. Here he must live misunderstood, his life a wreck, his powers unsuspected by those who might have given a helping hand and a kindly word.

No language can do justice to the two evils which I have mentioned, and which go hand in hand, and are indigenous in a country where caste and feudal principles are still uppermost, as in Germany. In Great Britain there is a somewhat better state of things; but America is the only land in the world where it is hard to remain unknown, and unused, and unhonored, if God has blessed you with any special aptitude. Men find their level at once; and such is the ease of exchanging employments, that those who discover in middle life that they have chosen wrongly, do not feel compelled to follow on in a mistaken walk to the end, but quickly adapt themselves to that for which they have a natural gift. These are the elements in our American democratic character which we should prize as precious beyond all computation; it is they for which we have been contending during all the war, seeking to keep them ascendant, in opposition to the efforts to extend the feudal or caste spirit over the whole union, and extinguish a polity so rich in beneficent influences, not to our nation alone, but to the whole world.

In carrying out the notion, "like father like son," we have here various grades of schools, adapted to the different grades of the population. We find for instance Poor Schools, People's Schools, Citizens' or Burghers' Schools, and select schools of all degrees. This takes us up in the social scale to those

families which can afford to have their own teachers, and have their children instructed beneath their own roof. Contrast this for an instant with the American system, which puts no stigma upon poverty by consigning the poor man's child to an inferior school, but for the future good of the State admits him to equal privileges with the son of the millionaire. Can any thing be said for the German system in comparison? And where do we find in the United States that a blacksmith, a carpenter, a shoemaker, or a trader is unfitted for his employment because he may have enjoyed advantages beyond the winter district school? Is it not proved over and over that the higher the education the more efficient becomes the man? He may indeed set iron and wood, in the form of machines, to do the work which in his uneducated state he was content to do, but is that any infringement of the natural order of things or of the providence of God?

Happily the university is a protest against the German system. It receives on equal terms all who visit it, and calls them all its children. The prices paid for the privilege of hearing the lectures are so low that few need be debarred, and all libraries and scientific collections are opened on equal terms to the rich and the poor. So far as this can rectify the evils introduced by class schools it does so, but it is not able to cope with the whole evil. Besides, it introduces in connection with what has been said above, a body of men who are exceedingly well educated, but whose life is a burden to themselves and to their friends. What can the scholars of this country do, is the question which has to be met. Some can become professors, some clergymen, some lawyers, some doctors, some teachers of the higher schools. But these professions are all capable of being filled to that point where a surplus of men entails poverty upon some and struggle upon all. In this condition Germany stands to-day; and the case of a young man who leaves the university and hopes to enter upon a career of usefulness and success is pitiable. He can scarcely expect to marry till he is thirty-five, and through the first years of his professional career he must struggle through difficulties and discouragements of which we have happily little conception in America. But could the idea once be exploded that the merchant, the artisan, the common-school teacher, are all the better prepared for their occupations, even by a university education, if it is at their command, a more propitious day would dawn upon Germany. A week ago I walked down to the Heidelberg University to hear Dr. Mendelssohn, a private-docent, *i. e.*, a graduate who is permitted to lecture, and who looks forward to a regular professorship. His theme was the modern Greek Revolution. My interest to see and hear him arose not so much from the fact that he is a very scholarly young man, as that he is the son of the great musical com-

poser of the same name. I found myself listening to a written lecture, carefully studied and eloquently read, but delivered to an audience of two—one gentleman besides myself. And thus it is too apt to be the case. The number of men whom the universities send out are so ill-proportioned to the number of places put at their disposal by the public sentiment of the country, that a young man has to fight a battle most discouraging and protracted, before he wins a place and a competence. There are some prizes, but more blanks. I know German professors of European reputation who are maintaining themselves and families on less than five hundred dollars yearly; and yet there is one professor here, at Heidelberg, whose net income, aside from that which his books bring in, is eight thousand dollars. I would not willingly see the number and efficiency of the German universities lessened; they are the best, the most democratic, and withal the most Christian institutions in the land, but I would gladly see an explosion of the old idea, that men who are to work with their hands lose their efficiency if their minds be educated, and that it is as great a harm to a peasant to know too much as it is to know too little.

The more I see of the working of these universities, the more convinced I am of the great advantage which they enjoy, in presupposing that the youth who resorts to them has chosen his future avocation already, and will select his studies with reference to that choice. Much may be said in favor of the American college system in this regard, I am fully aware; it is, for example, indisputable that the object which our colleges hold up so prominently, that of giving a good general culture, independent altogether of the future walk in life of the person receiving it, is a noble one; but we are met by the stubborn fact that our students generally do not apprehend till it is too late the relation of this general culture to their future usefulness, and so lose its advantages, waste their time in college, fall often into idle habits, frequently leave before the four years' curriculum is complete, and almost invariably are pursued by the demon of discontent, bidding them hasten from the cloistered seclusion of the college for the busy scenes of life. And on the other side, it may be said that the German course favors a too early, an immature selection of a profession; that carrying out the idea that the son should be what the father is, it commits the young man while a mere youth to a choice which he may regret. But I think that this is the better of the two; for supposing him to make an error, he will, under our plastic institutions, easily change his course when he is older, and fit himself for the place for which nature intended him; and even while he is working with a goal in view, wrongly chosen let us admit, he works with an impulse, ardor, and devotion which will do much to

secure to him that general educational culture which it is the avowed object of our American colleges to impart. The German youth pursue their studies, I find, with a zeal unknown in our colleges, excepting where there is a powerful impulse given by the ranking system, and more *uniformly* strong than even that system gives. And this is done although the universities are on the same ground with our Theological Seminaries, Law, and Medical Schools, and all instruction is conveyed through the medium of lectures. Not that every thing in this German system is to be commended. The gashed faces of the students show that the dueling system is only too well retained; the swaggering air and the fanciful caps indicate how much vanity is fermenting and sending light bubbles to the surface of society; but as a whole the universities appear to be the feature of German civilization most to be admired, and with care to be copied. And those of our colleges which have adopted side-institutions, moulded on the German model, Harvard, Yale, Dartmouth, and Brown have done wisely, as I have confidence that time will show.

One of the most striking features of these German universities is their modest architecture. Take this one at Heidelberg, for example, one of the most celebrated of all. It is a plain building in the market-place: no heavy elms shade it, no gravel walks lead to it, no green lawn surrounds it. It is a great, sunny, simple building, and the rooms within are even less striking than the exterior. Yet here have stood in past times Voss, Paulus, Thibaut, Geromies, Schlosser, and Umbreit; and here stand now the scarcely less known Rothe, Hitzig, Vangerow, Bunsen, Häusser, and Schenkel. Of these last names Rothe is the most prominent theologian, Hitzig one of the most accomplished orientalists, Schenkel the best known neologist, Vangerow the first lawyer, and Bunsen the ablest chemist in Germany. And yet how simple the appliances which they need for their art, how unpretending the building where they hold their prelections! The simplicity is almost idyllic, and carries one back to primitive times. Oh, that in all lands we prized as much the reality and as little the false pretense as do the simple-hearted Germans, who are content with their modest accommodations!

W. L. G.

#### A TRIP TO THE COAL REGIONS.

NEW YORK, Sept. 2, 1865.

*The Knickerbocker Colliery.—Mountain Railroad.—The Coal Field.—How the Mines look.—Underground Life.—Need of Schools.*

THE purest veins of the celebrated Lehigh coal are found near the summit of a range of mountains, in Schuylkill County, Pennsylvania. They are mined by the Knickerbocker Anthracite Coal Company,

which is organized on the "mutual" principle, each share making the holder a part owner of the coal region, bringing a fair dividend, and entitling him to receive annually a ton of coal at the mere cost of mining and shipping. The shareholders, consequently, represent various classes of the community, from the shrewd financier, seeking profitable investments, to the poor man anxious to effect a saving of from three to five dollars on each ton of coal. To exhibit to these various classes the actual condition of their property, their president, Dr. Hayes, the well-known explorer of the Arctic regions, lately invited a party of two hundred persons to an expedition to the coal regions.

Leaving New York just as the sunlight began to gild the heavens, we were soon on a special train dashing over the lowlands and across the rich fields of central New Jersey. Crossing the Delaware at Easton, the route was in a more northerly direction, affording a view of the mountainous scenery of Northwestern Pennsylvania. Crossing and recrossing the Lehigh River, which is almost constantly in view, the cars wind through mountain gorges, bold masses looming up and suddenly disappearing, hidden by other rocky hills, bright with foliage and sparkling with streams and cascades.

We thus dashed along, still at good speed, till we reached Mauch Chunk ("bear mountain"), a dwarf-town, the bounds of which have been determined by nature; for it is compressed into a gorge formed by the junction of three mountain ranges. The hills are here from five hundred to twelve hundred feet high. Mount Pisgah, the highest of these, on the base of which is built a portion of the town, is accessible by means of cars drawn up an inclined plane by a stationary engine. Leaving Mauch Chunk the iron horse loses speed. Up a heavy grade, up through ravines and gorges, up among rocks and boulders, wends now the train on its toilsome way. Our point of destination is only thirty-five miles from the station last passed; we have been hours on the way, but "the end is not yet." Presently, we make an abrupt turn toward the left, we find an engine laboring hard at each end of the train, a road running for miles around the sides of mountains is before us, in many places on embankments making one dizzy to look upon, and causing timid ones to grasp the car-seats and door-fastenings with a tight and nervous hand. But a fine panorama opens below, we are moving rapidly again, the ride is exciting, and in a jubilant mood we alight on the grounds of the Knickerbocker Company, giddy as school boys at a picnic.

We are at the border of a plateau, among encircling hills. The most striking object in view is a high building, one side of which is far up the hill, while the opposite side, constituting a covered inclined plane, extends for three hundred feet into the basin

below, seeming like a ropewalk raised at one end by scaffolding. The structure is technically termed the breaker, and includes all the machinery used in drawing to the top of the building the large lumps of coal brought from the mine, and for breaking, cleaning, assorting, and loading for transportation. The coal is at the mine made to fall into cars holding about three tons each, and is thence drawn by an engine over the inclined plane to an immense funnel at the top of the breaker. It is then passed over grates, the larger sizes falling through iron-lined passages, to be reloaded for shipment; the smaller pieces pass through crushing-rollers and a series of revolving cylindrical screens, till at length, having been freed from slate and assorted in size, they gradually descend to their respective places as "egg," "stove," and "chestnut" coal.

"The mines!" "The mines!" was the cry, after a brief inspection of the machinery.

"This way to the mines!" was the answer of the guide, and in a moment the party were filing along a footpath leading to an opening at the foot of a hill, resembling the entrance of an ordinary railroad tunnel.

Here occurred the memorable scenes of the expedition. "Wait a minute for the lanterns," shouted the guide, and he disappeared, returning toward the breaker. We waited perhaps a quarter of a minute, certainly no longer, and then we too disappeared, daintily endeavoring to keep upon the tramway, or railroad constructed for the coal-carts. This was not easily done, and soon all were engaged in petulant murmuring, boisterous laughter, or purposeless groping, in undiluted darkness. The arrangements for ventilating the mine not having been completed, the foul and sulphurous air was beginning to affect many, when a low rumbling was heard far ahead. It rapidly increased, and a faint light was discernible, causing some one to conjecture the nature of the phenomenon. "Look out for the mules!" was soon the alarm. There was at once a unanimous effort to secure safe positions. "Clear the track!" shouted the driver, as a train of carts dashed by, drawn by mules, only the driver's blackened face being observable in the dim light afforded by a little lamp fastened on his hat. The track was readily cleared, for only one step in the direction of safety was practicable, as the sides of the passage in which we had prematurely ventured were, on either hand, only at a distance of one pace from the rails of the tramway. In safety once more, clustering and crowding together, the party was presently startled by a deep boom suggestive of thunderbolts and earthquakes. This was supposed to be a "blast," as we had been informed that one hundred kegs of powder are used every month in the working of the mine, which consists in drilling and blasting.

Looking back toward the entrance, a light was once more discernible. Our guide appeared, supplied with only a single lantern.

Then, following as well as we could, the exploration was resumed. Groping, grumbling, tumbling, splashing, on we went, now losing our equilibrium as we tread upon a lump of coal, and go ankle-deep into a pool of water, now apologizing to some half distinguishable friend, who has lost his equanimity while searching for the hat which we unconsciously knocked from his head. On one side we scramble up a steep ascent, and view the miners at work, drilling and blasting. Then we resume our march through the tunnel, till we reach its furthest limit, hundreds of yards from the place of entrance, and from the surface of the hill over our heads. No striking objects have appeared. But whenever the lantern has been brought to the sides of the tunnel the coal has been found bright, hard, and pure, no stone appearing, and with only occasional intermixture of slate.

Our guide is here subjected to a catechetical ordeal. All sorts of questions are asked. Unsophisticated young man in pink cravat and white vest, illuminated with coal-dust, wants to know the difference between Anthracite and Lehigh. Funny fellow asks how many feet of coal is to be found between our own and those of the Chinese. Old gentleman with massive cerebellum wants to know why the works is not vigorously prosecuted, and all the coal taken out at once. We are here told that the vein extends for three quarters of a mile in the direction we have been pursuing; that the quantity of coal above water-level in this mine is more than a million tons; that below the water-level there is probably five times that quantity, which will remain unmined for ten or twenty years, as the mode of working will be more difficult and expensive.

Eight other veins have already been discovered on the lands of the Knickerbocker Company, several have been opened, some will require heavy timbering for support, where there is danger of the tunnels being filled up. While enjoying a substantial dinner at sunset, under the shelter of pine, hemlock, oak, and maple trees, the well-timbered hills around have a new interest, in view of the necessities for mining and building purposes, and the expediency of converting some of the trees into school-houses was suggested by facts not very creditable to the educational officers of the region. The various points investigated and discussed prove wholly satisfactory to the financiers, the novelty-seekers are gratified, soiled gloves and specimen coals are thrust into dusty pockets, overcoats are resumed, the day's work is done. The cars are refilled, the engine gives us a push and follows us at a distance of half a mile, while the train, without a guide or check, rolls swiftly down the embankments and natural declivities of the mountain, and we are soon on comparatively level ground, with a fair prospect of safely returning home, wiser and blacker men.

J. W. H. C.

## EDUCATIONAL INTELLIGENCE.

**NEW YORK.**—There seems to be increased interest in the welfare of the schools in various sections of the State. In the city of New York arrangements have been made for the accommodation of additional numbers of pupils, and several school buildings have undergone extensive repairs. In the practical working of the schools much yet remains to be attended to.

**PENNSYLVANIA.**—The Seventh Session of the National Teachers' Association was begun at Harrisburg on the 16th of August, continuing three days. Various papers were read and discussed, addresses were delivered by distinguished educators from various States, and the following topics, receiving elaborate discussion, awakened unusual interest:—

"What service can this Association render toward the establishment of Free Schools in the States lately in rebellion?"

"The Relations of the National Government to Education."

"How to cure the Evil of Irregular Attendance at our Public Schools?"

The proceedings have been extensively noticed by the daily press, and are exerting a beneficial influence.

**MARYLAND.**—The School Commissioners from the various counties met in convention August 22-23d, electing as permanent officer, Lieutenant-Governor C. C. Cox, President; Dr. Joel Hopkins and Dr. S. A. Harrison, Vice-presidents; Hon. Thomas A. Bolte and A. W. Small, Secretaries.

Among the subjects considered were the following: 1. "Should the President of the Board of Commissioners be relieved from the duties of District Commissioner?" 2. "Shall quarterly meetings of Board of Commissioners be held on the Wednesday next succeeding the end of each term?" 3. "Plans of school-houses; consideration of those proposed by the State Board." 4. "School Furniture." 5. "Salaries of teachers; how calculated; manner of payment—whether directly by the treasurer or through the District Commissioners." 6. "Salaries of Commissioners." 7. "Mode of distributing text books."

After resolutions asking the Legislature to amend the new school law so as to include those sections of the old law referring to compulsory attendance of pupils at school, and the imposing of penalties for employing children in factories, etc., who are not allowed to attend school, and that the fines for the above offense, as well as for other offenses named in the old law, be expended for school purposes, it was

*Resolved*, That this Convention resolve itself into an association to be known as the Association of the Commissioners of Public Schools of Maryland, and that, when

it adjourns, it shall adjourn subject to the call of the officers; and that a committee be appointed to prepare a suitable constitution, with by-laws, for the government of the association."

The efficient State Superintendent, Rev. L. Van Bokkelen, was actively engaged throughout the session. The deliberations seem to have been harmonious and enthusiastic, and to indicate brightening prospects for this disenthralled State.

—Prof. Thomas Lucy, an efficient worker in the cause of education in Maryland, has recently removed from Elkridge Landing to Baltimore. His new relations are with the Baltimore Female College, a well-known institution.

**VIRGINIA.**—The educational institutions are essaying the feat of the fabled phoenix, and though prostrated by the war, are already commencing a new career of usefulness and grandeur. The ancient college of William and Mary, at Williamsburg, has determined to renew its regular sessions this fall. The University of Virginia, at Charlottesville, commences its regular courses on the 1st of October. Its work was not suspended during the war.

**KANSAS.**—The Hon. I. T. Goodnow, Superintendent of Public Instruction, has been unable to secure satisfactory returns from many of the county superintendents, in consequence of the disturbing influences of the war. The information received has, however, been carefully arranged in his annual report. The number of districts appears to be 823; out of 37,979 children between five and twenty-five years of age, 22,667 were last year enrolled in the schools; 205 male teachers were employed at an average salary of \$27 per month; female teachers, 527, average salary, \$16.60.

**HOLLAND.**—The education of the people is very well attended to. It is not compulsory, but every inducement is held out for parents to send their children to school. The teachers are well trained for their work, and well paid; the fees are low, and if parents are unable to pay at all, their children receive their education gratuitously; and parents, who will not send their children to school, are uniformly denied relief from the government funds. There is a normal school for the education of schoolmasters in almost every important town. Nearly every child in Holland, above ten years of age, is at least able to read and write.

**BELGIUM.**—Education is almost entirely under the direction of the priests. It is said to be better attended to than in France and Austria. The subjects taught, however, are the most elementary—a little reading, a lit

the writing, and a very little arithmetic. Attendance at the schools is not compulsory.

FRANCE.—In the Educational Sliding Scale which Keith Johnson gives in his Physical Atlas, France stands about midway, Saxony being at the top, and the poor old Pontifical States and Russia being at the bottom. The national system of education in France was introduced by M. Guizot in 1833, and provides that every commune or parish shall have at least one elementary school. Attendance is not compulsory, but no child is permitted to be employed in the

factories until it has reached the age of nine. Popular instruction is, however, very unequally distributed; for while in some departments it is almost complete, others are not half provided for. The eastern departments are the best educated—twenty years ago the proportion of those above twenty years of age unable to read, being only one in ten, and it is to be hoped that since then this one has taken to better ways. The departments of the center and west are in a far worse condition, the ratio of those unable to read being seven to ten.

### CURRENT PUBLICATIONS.

HISTORIES of literature are of two kinds. The one is scholarly, exhaustive, and critical, designed solely for the student who has devoted himself to any branch of literature. This class may again be divided into two others, the works of the first giving every species of criticism, together with their sources, and are storehouses of learning and erudition, of which Bähr and Bernhardt are types; the second, less learned, more biographical, more discursive; of which the types are Browne and Dunlop. These are characteristic of the respective schools of Philology which they represent, the German and the English.

The other kind of Histories of Literature is that designed for the general reader, and these works are very aptly called "Compendiums," by Professor Cleveland. They are more popular in form, and abound in extracts sufficient to give a general idea of the style of each author, and to store the mind of the reader with literary gems. If we reflect, we will find that the most of our knowledge is derived from compends, and that they have become necessary to general education and general information.

Some collect, collate, and generalize in each department of literature, but the great majority can do but little more than read the results of their labors, and these often in the most succinct form. Of all these compends of knowledge none builds us up more rapidly in information, literary culture and historical ideas than the compendiums of literature. Neither should ignorance of a language be any bar to a general knowledge of the authors and literature of other nations. We find many well acquainted with the genius and spirit of Schiller, Goethe, and Jean Paul without an acquaintance with the German language. There is no room here to discuss the question whether any literature can be profitably read through translations. We would suggest, however, that our Bible is a translation, and that the Germans know more of Shakespeare (thanks to the transla-

tion of Tieck and Schlegel) than do we. If there were no other reason, yet the standard of modern education is demanding wider and more general information. But what literature is more interesting for its genius, its originality, its freshness, its antiquity, than that of Greece and Rome. Here we have the first and best fruits of the mind of man; the model of modern literature, and the curriculum of modern education. To the translation of it almost every poet of note has devoted some of his energies. Surely there was a necessity for a "Compendium of Classical Literature,"<sup>(1)</sup> and there were abundant and most excellent materials. This need Professor Cleveland has fully met, and these materials he has faithfully used. It is not, nor does it pretend to be a critical work for the use of scholars; but it is what it purports to be, a popular treatise for the general reader, and all those who in the process of their education have not the time or the inclination to master the classics. With such a book within reach no one need be mortified through ignorance of the great names in the literature of antiquity; but in addition may see "through a glass darkly" some of the beauty of ancient mind.

The works of Professor Loomis are all favorably known. Few of them, however, have stood the test of public opinion so well as his text-book of "Natural Philosophy."<sup>(2)</sup> The peculiarity of this work is in ignoring the existence of a centripetal force. This innovation involves many tedious explanations in curvilinear motion, which are avoided by calling the attracting agencies "centripetal force," while students comprehend it quite as well. The language of the work is

(1) CLEVELAND'S COMPENDIUM OF CLASSICAL LITERATURE. New York, Philadelphia, and Chicago: Schermerhorn, Bancroft & Co. pp. 622. \$2.50.

(2) ELEMENTS OF NATURAL PHILOSOPHY, designed for Academies and High Schools. By ELIAS LOOMIS, LL.D., Professor of Natural Philosophy and Astronomy in Yale College, &c. New York: Harper & Brothers. 12mo. pp. 351. \$1.00.

so concise, that the teacher who uses it with advanced classes, might advise *verbatim* recitations from it.

No person is so well qualified to compile a text-book upon any given subject as the teacher who has instructed upon that subject by lectures for many years. What to give and what to omit are the difficulties besetting the compiler. Hence Dr. Draper's experience and good judgment insure an excellent text-book on chemistry.<sup>1</sup> This work is one of the finest elementary books extant. Indeed, so successful has he been as an instructor, that a book needs no higher commendation than to have him as its author. Berzelius, the father of chemistry, always mentioned him in terms of the highest respect, and regarded him as occupying a high position among the ablest investigators of the age. Dr. Draper's discoveries, some of which he modestly alludes to in his book, have been numerous, and so important that Bunsen and Tomlinson, thinking him dead, have taken to discovering them over again. In this chemistry the topics are selected in a judicious manner, and are so discussed as to excite interest in the student. We know of no work so thoroughly deserving and so well adapted for use in schools as this of Dr. Draper.

Chemistry, not Physics, is the stronghold of Dr. Draper. He has, however, given us a good text-book on "Natural Philosophy."<sup>2</sup> The arrangement is somewhat unique. He treats first of Pneumatics, believing it better to excite interest in the study before taking up the dry Mechanics. Astronomy is also briefly discussed in its physical bearings. This work shows the same anxious effort after accuracy and clearness, without regard to beauty of style, so characteristic of all Dr. Draper's works. The Natural Philosophy hardly equals the Chemistry in excellence, but is as good as the most of its rivals.

Text-books on scientific subjects multiply rapidly. Scarcely a month passes without yielding some new work. This, however, is natural. Discoveries succeed each other so quickly, that "to keep up with the times," new editions of standard works would need to be issued monthly. This is impossible, and hence the demand for new ones. Dr. Hooker, of Yale College, has attempted, we think successfully, to supply the demand. His "First Book in Chemistry,"<sup>3</sup> is excellent. We are somewhat opposed to the simplifica-

tion and "drawing out" of scientific subjects. But here, as in the case of Faraday, we must make a notable exception. The author adopts the method so successfully employed by that savior in his "Chemistry of a Candle," giving children pleasing explanations of every-day occurrences in such a manner as to arouse curiosity.

"The Child's Book of Nature"<sup>4</sup> is of the same character. Both in its plan and execution it is adapted to the instruction of children, and must prove a valuable assistant to parents and teachers. Indeed, children of a larger growth would profit by a perusal of the book. Higher in grade is the "Natural History."<sup>5</sup> We like this book; not because a text-book on Natural History is any thing new under the sun, for surely we have enough of such, but because the subject is treated in a manner so simple and familiar, yet dignified, as to render the road to knowledge almost royal. The book, in style, is unlike most others of its class, as they are generally written in a hard, concise style, fit only for a heavy, scientific report. We approve of the glossary, which, instead of defining the terms, refers to the page on which the definition is fully given and illustrated.

Dr. Hooker's series closes with "Science for the School and Family,"<sup>6</sup> in three parts—I. Natural Philosophy; II. Chemistry; and III. Geology. These books give such points as are essential to every well-informed man, and avoid technical discussions. The "Natural Philosophy" is not a better text-book than those which we have already noticed. It might serve as an excellent introduction to the books of Dr. Loomis or Dr. Draper. The "Chemistry" is quite a good book. The author evidently has not endeavored merely to make a book, and the work, therefore, is not encumbered with the trashy observations too common in such works. We doubt the advantage of the arrangement of topics. The student might profit more by learning the principles of chemical philosophy before studying the peculiarities of the elements. The atomic theory, with its three great laws, should be thoroughly understood before the pupil attempts any investigation of its effects. We regret also that a desire for novelty has betrayed Dr. Hooker into placing the discus-

Yale College. New York: Harper & Brothers. Small 4to. pp. 231. 90 cents.

(3) A TEXT-BOOK ON CHEMISTRY, for the use of Schools and Colleges. By JOHN WM. DRAPER, M. D., LL.D., Professor of Chemistry in the University of New York, &c. New York: Harper & Brothers. 12mo. pp. 452. \$1.00.

(4) A TEXT-BOOK ON NATURAL PHILOSOPHY, for the use of Schools and Colleges. Containing the most recent discoveries and facts compiled from the best authorities. By JOHN W. DRAPER. New York: Harper & Brothers. 12mo. pp. 281. \$1.00.

(5) FIRST BOOK IN CHEMISTRY, for use in Schools and Families. By WORTHINGTON HOOKER, M. D., Professor in

(6) CHILD'S BOOK OF NATURE, Intended to aid Mothers and Teachers in training Children in the Observation of Nature. In three parts. I. Plants; II. Animals; III. Air, Water, &c. By PROFESSOR HOOKER. 4to. pp. 470. \$2.00.

(7) NATURAL HISTORY. For the use of Schools and Families. *Ibid.* 12mo. pp. 352. \$1.50.

(8) SCIENCE FOR THE SCHOOL AND FAMILY. *Ibid.* Part I. NATURAL PHILOSOPHY. Illustrated by 300 Engravings. 12mo. pp. 346. \$1.50.

Part II. CHEMISTRY. Illustrated by numerous Engravings. 12mo. pp. 435. \$1.50.  
Part III. MINERALOGY AND GEOLOGY. Illustrated by numerous Engravings. 12mo. pp. 350. \$1.50.

sion of the so-called "imponderables" at the end of his book. Part III., on Geology and Mineralogy, is hardly equal to the others. It is not characterized by the same moderation and impartial judgment. We think it improper in any man, however well informed, to slur over the reputations of such men as Agassiz, Smith, Lamarck, and Morton. Nor should Darwin and Huxley be spoken of lightly. True, the development theory is still under discussion; and savans have not yet decided whether man is of one or many stocks; and for this very reason we maintain that theories concerning these subjects should be treated with respect. For the intelligent teacher it will prove a text-book of decided merit. On the whole, Dr. Hooker's works are accomplishing a great work in awakening attention to the importance of the sciences as a means of mental development. He is thoroughly in earnest, and determined to profit the youth in America.

Mr. Emerson's "Logic of Algebra" results from his discovery that our present systems of mathematics are very "unsatisfactory and incorrect," and is an attempt to place them upon a proper basis. The attempt is praiseworthy, but, considering the magnitude of the undertaking, and the liability of man to err, we think the author would have evidenced better judgment, and rendered his work more acceptable to the reader, had he been less dogmatic and arrogant in his assertions. He denounces logarithms, and promises something better in his treatise upon arithmetic, for which we therefore wait with patience, as we too lack a love for logarithms. Mr. Emerson advances some new points of value, and altogether the work is worth the price.

The "Atlantic Monthly," for September, contains the following articles:—Coupon Bonds, I., by J. T. Trowbridge; Wilhelm Meister's Apprenticeship, by D. A. Wasson; Needle and Garden, IX.; Scientific Farming, by Gail Hamilton; Dr. Johns, VIII., by Donald G. Mitchell; Natural History of the Peacock, by T. W. Parsons; Up the St. John's River, by T. W. Higginson; A New Art Critic, by Eugene Benson; The Luck of Abel Steadman, by the author of "Life in the Iron Mills;" Sonnet, by T. B. Aldrich; The Capture of Jeff. Davis; The Chimney Corner, IX., by Mrs. H. B. Stowe; A Visit to the Edgeworths, by Mrs. Farrar; On a Pair of Old Shoes, by Charles L. Sprague; Commemoration Ode, by J. R. Lowell; Our Militia System; At Bay Ridge, Long Island; "Running at the Heads."

"Harper's Monthly Magazine," for September, has the following interesting table of con-

tents:—September (poetry); a trip to Bodie Bluff and the Dead Sea of the West (concluded); Love in a Hospital (poetry); Miss Pink's First Season; Niagara in Spring (poetry); Sketches of Social Life in China; Tom Malory's Revenge; Anæsthesia; the Pond House; Milford; Armadale, by Wilkie Collins (continued); The Helmsman (poetry); Street Education; Margaret Bronson; Hannah Fanthorne's Sweetheart; Our Mutual Friend, by Charles Dickens (continued); Recollections of an Old Fogey. The "Editor's Easy Chair" is, as usual, quite interesting, and the "Drawer" will never be void of plenty of wit and humor.

"Trubner's American and Oriental Literary Record," is a valuable register of the most important works published in America, India, China, and the British provinces, with notes on the literature of other nations. The current number has an article on "American Literary and Scientific Intelligence," and enumerates the "American Works in Preparation," "American Periodical Literature," "New American Books," and "American Books on Military History and Science."

A little book<sup>10</sup> by the author of "Sunbeams and Shadows," has been published, and will prove almost as interesting to the young folks as that popular work has been. It is most suitable for girls, has a variety of incidents that will please the most undisciplined mind, and embraces some capital boarding-school scenes which will please any one.

To the series of German text-books, &c., recently noticed in the MONTHLY, has been added a little work,<sup>11</sup> consisting of specimens of the most popular modern German Ballads, with biographical sketches, notes on the text, and introductions to those poems which are founded on history and legend.

The "Massachusetts Teacher," for August, has an article on a subject which teachers must regard with interest, and which has been discussed in the MONTHLY. The article is entitled "Pronouncing Orthography." It endeavors to provide a remedy for the irregularities of our orthography, and while avoiding the objections made to phonetic print, to secure its essential advantages.

The "Maryland School Journal" is published regularly, with a degree of ability which should have wider scope. We trust that the recent educational movements will awaken an interest that will make an enlargement of the "Journal" expedient.

The "Illinois Teacher" has a Mathematical Department, conducted by Prof. S. H. White.

(9) THE LOGIC OF ALGEBRA. An Essay on the Fundamental Principles of Algebra, for the purpose of placing that science upon a more correct basis. By SAMUEL EMERSON, A. M. New York: W. I. Pooley & Co. 8vo. pp. 82. 25 cents.

(10) SEA DRIFTS. By MRS. GEORGE A. HULSE McLEOD. New York: Carter & Brothers. 16mo. pp. 764.

(11) DEUTSCHES BALLADEN-BUCH, etc. Von PROFESSOR L. EMMERSON. Boston: De Vries, Ibbart & Co. 16mo. pp. 82.

## SCIENCE AND THE ARTS.

—A meteoric stone fell recently in France, which, besides the usual inorganic constituents, contained six per cent. of a black amorphous organic substance—a kind of humus, which consisted of the organic elements, carbon, hydrogen, and oxygen, in proportions quite similar to those in which they occur in lignite and peat. M. Wohler reports other cases of a somewhat similar character, but none so conclusive as that just mentioned; and he infers that, wherever meteorites come from, organic matter, and hence probably organized matter—organisms in fact—must also have an existence. That the meteorites should contain volatile and decomposable substances, is not inconsistent with the fact of their incandescence, for this may have been produced suddenly, and affected their surface only, not penetrating to the interior of the mass.

—In speaking of the generally smaller cranial capacity in females and the closer approximation of the type of their skulls to those of the lower races, Dr. Vogt shows that the difference is greater according to the development of the race; so that, in this respect, the "male European excels much more the female than the negro the negress." Speaking of the discussions concerning man's relations to apes, he says that a wide gulf still exists between them, but he expects much for the future. "Twenty years ago fossil monkeys were unknown, now we have nearly a dozen; who can tell that we may not in a few years know fifty? A year ago

no intermediate form between *Semnopithecus* and *Macacus* was known; now we possess a whole skeleton; who can assert that in ten, twenty, or fifty years, we may not possess intermediate forms between man and the ape?"

—The English system of announcing storms by telegraph has been adopted in Prussia.

—Observations with an improved anemometer prove that the wind rarely blows in a perfectly horizontal direction. The deviations from that direction, although usually very small, are sometimes very remarkable, and follow each other in such a way, especially during strong breezes, as to indicate a species of undulatory motion in the wind.

—A mechanical contrivance, invented by Mr. S. Bourne, of London, preserves liquids from the injurious effects of the atmosphere in casks or other vessels. It is a "patent flexible diaphragm," or thin membrane, so placed as to divide the vessel into two separate chambers, the lower of which contains the liquid, while the upper one becomes filled with the air that enters as the fluid is drawn off. The membrane, fitted in with a water-tight joint, adapts itself to the form of the vessel, expands so as to allow it to be entirely filled, and rests on the surface of the liquid, while the latter sinks, and effectually protects it.

## MISCELLANY.

—The application of soap as a detergent is not of high antiquity. Like many other useful things, it seems to have been known for a considerable time before it was turned to its most servicable account. Soap at first was merely a cosmetic for smoothing the hair and brightening the complexion. When once its valuable cleansing powers were discovered—doubtless by accident—the employment spread rapidly. Numerous soap manufactories sprang up in Italy, notably in the little seaport town of Savons, near Genoa, whence the French name of soap, "savon." The manufacture soon spread into Spain and France. Marseilles became famous for its marbled soap. Our word "soap" probably comes from the Latin "sapo," which is mentioned by Pliny as an invention of the Gauls. It is generally believed that the difference

in spelling between the English and Latin names arose from the ignorance of some copyist in the Middle Ages.

—To talk of yourself without being vain, and to talk of others without slander, are two hard things for some people, too hard for others.

—The patriotic hymn "America" was written forty years ago, for a Sunday School celebration.

—Incredible as it may seem, many of the richest planters in Jamaica live on coffee grounds.

—The letter C is like a schoolmistress—it forms lasses into classes.